













# **SPECIAL SERVICES ANALYSIS**

## **FINAL REPORT**

**Submitted To**  
**CHICAGO TRANSIT AUTHORITY**  
**OPERATIONS PLANNING**

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# CHICAGO TRANSIT AUTHORITY SPECIAL SERVICES ANALYSIS

## EXECUTIVE SUMMARY

### OVERVIEW

This study consists of a comprehensive operational, management, policy, and planning review of the Special Services program of the Chicago Transit Authority. Special Services provides advance-reservation, demand-responsive transportation to residents of the City of Chicago who cannot use CTA's regular transit services due to physical handicap. The complete Final Report documents the analyses conducted, findings, results, and recommendations; this Summary highlights the major findings and recommendations within each section of the Report.

### Section 1: Goals, Objectives, and Performance Measures

Since initiating service in 1981, the Special Services program has operated without any regular program of performance monitoring, even though its computer scheduling and dispatch system is capable of generating valuable data. A performance monitoring program is recommended to provide CTA management with a monthly and annual review of system operations, service quality, and overall performance.

### Section 2: Operations and Performance

Evaluation of Special Services operations and procedures found a high level of enthusiasm and commitment to the program yet significant room for improvement in both efficiency and effectiveness. In comparison with other special transportation systems, Special Services' productivity is below average at only 1.7 to 1.8 passengers per vehicle service hour, and service reliability is less than acceptable. While some problems originate in established policies, the program's scheduling and dispatch procedures were found to be very inefficient and maybe the single most limiting factor in improving productivity. Recommendations are made to



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improve the scheduling and dispatch process and standardize internal procedures for improved efficiency.

Analysis of policies governing Special Services found recent review and strengthening of policies relating to vehicle wait times, no-shows, late passengers, and cancellations. It is recommended that CTA formalize a policy on maximum ride times and that subscription trip policies be reconsidered and, at a minimum, temporary cancellations be limited to no more than 30 to 60 days.

The study's personnel analysis examined the current staffing of Special Services, analyzed job functions, selection, and formal job descriptions. These analyses found that job descriptions are generally inadequate and do not reflect the position responsibilities and that there were no clear benchmarks for assessing job performance. Recommendations are made to revise job descriptions, expand monitoring of individual performance, and adopt formal selection and hiring procedures.

Special Services' computer scheduling and dispatch system was found to be capable of supporting a much larger service than CTA's and of operating at a much higher level of performance. Recommendations are made to improve the software and the use of the system which could result in more efficient scheduling, higher productivity, and better reporting.

### Section 3: Estimating Demand for Special Transportation

This section projects the demand for Special Services trips under the status quo and expanded eligibility in the years 1984, 1988, and 1992. According to the developed projections, current services are meeting only about one-quarter of present potential demand and expansion of eligibility to those Chicago residents who can use regular transit but with great difficulty would add another 2,014 one-way trips per weekday, for a total weekday demand of 3,567 one-way trips.

### Section 4: Contracting Options

This section reviews the issues and opportunities for contracting all or part of CTA's Special Services program. It summarizes the experience



using private contractors for paratransit services of other major transit systems across the country as well as in the Chicago area. Contracting options are identified, ranging from the contractor providing all services to only subfunctions of the program. This task includes a brief discussion of the steps to implement a contracting option.

#### Section 5: Organizational Structure

Analysis of the Special Services program within the overall CTA organization found that every division within the CTA is involved in the provision of Special Services to some extent, but, in each case, Special Services plays a secondary role to their primary mission. The program's role was not well defined nor has authority been granted for active overseeing of the program. Modification of the organization is recommended in order to give the Special Services program adequate undivided management attention and three options for accomplishing this are presented.

#### Section 6: Vehicles and Facilities

The present Special Services Superior and Carpenter vehicles were selected on the basis of criteria which included diesel power, wheelchair and seated capacity, expected roadworthiness on Chicago's streets, and flexibility to handle unknown demands. These criteria appear to be realistic in terms of the services being provided and CTA's capital program.

In order to meet the demand levels projected under the status quo and expanded eligibility, this section estimated that the Special Services fleet would need a total of 71 vehicles to meet present demand (62 in service plus 12 spares) and a fleet of 121 vehicles to meet the demand if eligibility to the program were expanded (101 in service plus 20 spares).

The study found that an inordinate amount of non-productive time occurs before the first pickup and after the last drop-off for each vehicle each day. This excessive time, however, is due to both deadhead travel to the first pickup and from the last drop-off back to the Washington Garage and to the inability to adjust operator schedules to actual demand patterns. While remote vehicle placement could reduce deadhead



somewhat, this strategy is not recommended due to probable negative impacts on management control and the likelihood of major program modification.

#### Section 7: Integration with Accessible Rail

As Chicago's rail transit system becomes more accessible, the Special Services program should function as a feeder to the rail system for those handicapped residents who are able to rail system and make necessary transfers between trains and stations. However, the decision to transfer a trip to the rail system will have to be made on a case by case basis, considering the length of trip, accessibility of adjacent stations, time or direction of travel with regard to peak commuter travel, and other nontransferrable trips being carried by Special Services. As the rail system is made accessible, CTA should expect all handicapped who can possibly use that system to do so.



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SECTION 1  
GOALS, OBJECTIVES AND PERFORMANCE MEASURES

GOALS AND OBJECTIVES

The Special Services Program was initiated in 1981 in response to Section 504 requirements that CTA provide fully-accessible transit services for those citizens who are unable to utilize its regular transit services. This legal impetus for providing these specialized services is matched by a real need for such demand-responsive, reliable transportation services to meet the travel requirements of Chicago's handicapped residents, as demonstrated by the present ridership of the Special Services Program and demands for additional service.

Evaluation of the present Program and planning for its future direction and development must be guided by the goals and objectives which the Program is designed to achieve. Very simply, goals are the policy statement of the program's focus and purposes, and objectives are measurable aspects and interpretations of these goals. Although no formal written goals and objectives exist for the Special Services Program, they may be perceived through its origin and present policies and operations and clarified through interviews with management and operating staff. From these sources, the following are perceived to be the overall goal and objectives for the Special Services Program.

OVERALL GOAL OF CTA SPECIAL SERVICES PROGRAM

To provide convenient, door-to-door transportation to Chicago citizens who cannot use CTA's regular transit services by reason of physical handicap.

PROGRAM OBJECTIVES

- To make transportation available regardless of trip purpose.
- To provide safe, reliable service.
- To carry a maximum number of trips at a minimum cost.



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## PERFORMANCE MEASUREMENT

### Overview

Regular monitoring of specialized transit performance has become essential due to the highly visible nature of these services and the frequent disparity between demand and system capacity. These basically political reasons for performance monitoring are reinforced by the need of management to closely monitor system operations, budgetary performance, service quality, and safety so as to make adjustments where necessary and to anticipate changes in service demand or system operations. A final and very important purpose of performance measurement is to determine system progress toward achieving the specified goals and objectives for that system and its services to allow adjustment of the system or reconsideration of the goals and objectives.

Since initiating service in 1981, the Special Services program has operated without any regular program of performance monitoring with the one exception of monthly reports on applications and certifications for eligibility. Such applications, however, provide no indication of service quality or system performance. The computerized scheduling system computes a number of important performance statistics, yet these are only informally reviewed and are not available outside the direct Special Services unit. The only data regularly available to CTA planning and management staffs have been monthly trip counts obtained by phone from the Special Services staff.

The remainder of this section sets forth a performance monitoring program to provide CTA management with a monthly and annual review of system operations, service quality, and overall performance. The section identifies appropriate performance indicators, defines their data content and sources or collection procedures, sets target values for the indicators, and suggests a monitoring process within CTA.

### Performance Indicators

For a specialized transit program, appropriate performance indicators are selected based on established program goals and objectives and



the identification of other critical aspects of operations and service. Among these issues frequently are performance of subareas of the operation, detail on ridership, the use of labor in the program, maintenance effectiveness, costs, and safety.

Thirteen performance indicators are suggested in Table 1-1 for CTA's Special Services program for monthly and/or annual monitoring. Certain indicators are only really useful for month-to-month monitoring of change -- service quality and ridership detail are within this category -- while other indicators may not be particularly significant or may require data not normally available on a monthly basis -- in this category are cost measures and accident data.

For the recommended performance indicators in Table 1-1, Table 1-2 briefly summarizes the significance of each measure and identifies the data required for each. Table 1-3 provides detailed definitions of each required data item, the period for which they would be needed, and the expected source of each item within the CTA and Special Services organizations. To the extent possible, these data items are defined in accordance with UMTA Section 15 requirements.

#### Identifying Target Values

For management and operating staff, performance indicators become particularly important when meaningful values are attached to the measures for both the current transit service and for that system's expected performance. Since these expected values provide the calibration to judge the system's actual performance as either good or poor, care must be taken to ensure that the target values are realistic and achievable for the system, its operating environment, and clientele.

Target indicator values are usually developed either based on the experience and performance of similar transit systems or through analysis of trend data showing the system's past performance. This study initially pursued the strategy of setting target values for the Special Services program through the performance of twelve "peer" systems originally iden-



TABLE 1-1  
RECOMMENDED PERFORMANCE INDICATORS  
AND EVALUATION FREQUENCY

	Frequency of Evaluation	
	Monthly	Annual
Passengers Per Vehicle Service Hour	X	X
Scheduled Trips as Percent of Total Requests	X	
No-Show Passengers as Percent of Total Booked Trips	X	
Late Cancellations as Percent of Total Booked Trips	X	
Total Lift Users as Percent of Total Passengers	X	
Total Wheelchair Users as Percent of Total Passengers	X	
Gross Operating Costs Per Vehicle Service Hour		X
Gross Operating Cost Per Passenger		X
Platform Hours as Percent of Vehicle Service Hours	X	X
Percent of Pickups On-Time	X	
Average Trip Travel Time	X	
Total Vehicle Miles Per Roadcall	X	X
Accidents Per Million Vehicle Miles		X





TABLE 1-2: DESCRIPTION OF RECOMMENDED PERFORMANCE INDICATORS

Performance Indicator	Description of Significance	Required Data Items
Passengers Per Vehicle Service Hour	Productivity measure indicating scheduling efficiency and level of individual demand being served. Will be affected by extent of group riding in system as well as system policies	Total Passengers Total Vehicle Service Hours
Scheduled Trips as Percent of Total Requests	Measure of scheduling effectiveness versus level of demand for services, that is, how close the system is to meeting its actual received demand for service.	Total Scheduled Trips Total Requests for Service
No-Show Passengers as Percent of Total Booked Trips	Service policy indicator monitoring degree of problem existing with regard to no-show passengers.	No-Show Passengers Total Booked Trips
Late Cancellations as Percent of Total Booked Trips	Service policy indicator monitoring degree of problem existing with late cancellations.	Late Cancellations Total Booked Trips
Total Lift Users as Percent of Total Passengers	Measure of user characteristics. Indicates percent of clientele which requires passenger lift. Measure may explain low productivity of system due to longer loading time required for lift access.	Total Lift Users Total Passengers
Total Wheelchair Users as Percent of Total Passengers	Measure of user characteristics. Indicates percent of clientele which requires passenger lift and securement. Measure may explain low productivity due to longer loading time and securement of wheelchair.	Total Wheelchair Users Total Passengers
Gross Operating Costs Per Vehicle Service Hour	Cost-efficiency measure of total resources required (in dollars) to produce an hour of special transit service.	Gross Operating Cost Total Vehicle Service Hours
Gross Operating Cost Per Passenger	Cost-effectiveness measure of total resources required (in dollars) to produce one unit of consumed service. This is a highly complex indicator affected by many facets of the system's operations including demand	Gross Operating Cost Total Passengers





TABLE 1-2: DESCRIPTION OF RECOMMENDED PERFORMANCE INDICATORS (Con't)

Performance Indicator	Description of Significance	Required Data Items
	levels, scheduling efficiency, on-street operations, etc., and, so long as total costs are accounted, provides a comprehensive snapshot of Special Services performance from one period to another.	
Platform Hours as Percent of Vehicle Service Hours	Labor efficiency measure indicating the productive use of vehicle operator labor. Will be affected by run cutting, scheduling of tours and changeouts, and CTA labor practices and agreements.	Total Platform Hours Total Vehicle Service Hours
Percent of Pickups On-Time	Service quality measure of effectiveness and reliability of scheduling and dispatch processes. To some extent, measure may explain no-show performance and long trip times.	Pickup Time Analysis
Average Trip Travel Time	Service quality measure of average time required for a trip. Measure is affected by size of service area or travel zones, trip making patterns, and scheduling practices.	Average Trip Travel Time
Total Vehicle Miles Per Roadcall	Maintenance performance indicator of effectiveness of regular and preventive maintenance. Measure affected by age of service fleet, operating conditions, and defined practices regarding roadcalls.	Total Vehicle Miles Total Roadcalls
Accidents Per Million Total Vehicle Miles	Measure of overall system safety. Affected by operating conditions, extent and type of exposure.	Total Reportable Accidents Total Vehicle Miles



TABLE 1-3: REQUIRED DATA ITEMS

Data Items	Definitions	Reporting Frequency		Data Source
		Monthly	Annual	
Total Passengers	The number of boarding passengers, whether revenue producing or not, carried by the Special Services program.	X	X	Passenger Performance Summary (existing data)
Lift Users	The total number of boarding passengers who required the passenger lift to board and/or deboard the vehicle whether or not they were in a wheelchair.	X		Passenger Performance Summary (existing data)
Wheelchair Users	The number of boarding passengers who were using a wheelchair or similar vehicle at the time of their trip.	X		Operators Final Trip Sheet (data not presently tabulated)
No-Show Passengers	Number of passengers who fail to appear at their designated pickup point at the agreed upon time whether or not contacted by dispatcher.	X		Passenger Performance Summary (existing data)
Total Late Cancellations	Number of trips cancelled within 4 hours of the promised pickup time.	X		Operators Final Trip Sheet (data not presently tabulated)
Total Requests for Service	Number of requests received by Special Services for advance reservation trips. Usually involves an outgoing trip and return trip. Does not include requests for subscription or standing-order service.	X		Scheduling Records (existing data)





TABLE 1-3: REQUIRED DATA ITEMS (Con't)

Data Items	Definitions	Reporting Frequency		Data Source
		Monthly	Annual	
Total Scheduled Requests	That portion of Total Requests which can be accommodated within the available service capacity for the trip origin, destination, and time desired. Figure does include all trips which may subsequently cancel or be no-shows.	X		Scheduling Records (existing data)
Total Booked Trips	A count of all one-way trips to be provided on a specific day whether by subscription or advance-reservation as of the close of business on the prior day.	X		Scheduling Records
Total Platform Hours	All time during which an operator operates a revenue vehicle, either in service or in deadheading, including layovers, breaks, and lunch if paid time.	X		Accounting Records (date not currently tabulated)
Total Vehicle Service Hours	The total number of hours that each Special Service vehicle is available to provide service, from "start run" time to "quit" time less breaks and lunch.	X	X	Passenger Performance Summary data is presently inaccurate, counting only total time from first pickup to last drop-off
Total Vehicle Miles	Includes service miles plus all mileage accumulated by buses for road relief, training, deadhead, hostling, etc. -- total miles driven by passenger service vehicles excluding charters.	X	X	Passenger Performance Summary (existing data)



TABLE 1-3: REQUIRED DATA ITEMS (Con't)

Data Items	Definitions	Reporting Frequency		Data Source
		Monthly	Annual	
Gross Operating Cost	Means all costs in the operating expense object classes exclusive of the costs in the depreciation and amortization expense object class.		X	Accounting (existing data following annual audit)
Reportable Accidents	Accidents in which personal injury and/or property damage results.	X	X	Kept by Safety Department
Roadcalls	A count of service interruptions caused either by failure of vehicle mechanical systems or failure of tires, air conditioning, or out of fuel-coolant-lubricant. Roadcalls normally require the transfer of passengers to another service vehicle for completion of their trip.	X	X	Kept by Maint. Department
Percent Vehicle Arrivals On-Time	That percentage of all vehicle arrivals for picking up a passenger which occurs between 10 minutes prior to and 10 minutes after the promised pickup time. Time should be recorded when vehicle arrives at the designated pickup location. Normally computed on a sample basis.	X		Quality of Service Report
Average Trip Travel Time	Average time a passenger is on-board a Special Services vehicle from pickup at the origin to debarking at their destination. Normally computed on a sample basis.	X		Operators Final Trip Sheet (data not currently tabulated)

tified by CTA staff.\* Although data was available from some of these peer systems, most of these systems also transport elderly citizens as well as handicapped, while Chicago transports only handicapped residents. Since the elderly as a group are more mobile and more efficient tours can generally be developed with a higher level of trip requests, systems transporting both elderly and handicapped have a distinct operating advantage over a strictly-handicapped system such as Special Services. There being no reliable method of adjusting for the effect of combining elderly and handicapped services on performance, the peer comparison approach was abandoned for the purpose of defining target indicator values.

The second common approach to establishing performance indicator targets is through the historical performance of the system itself. Comparison against prior performance incorporates any environmental, client and system characteristics which may make the system different from similar services, yet fails to indicate how well the system is performing except against its prior performance. In order to utilize this trend approach, reliable values for the desired performance indicators must be available for past periods. Our analysis of the Special Services system has found that much of the needed data either is not presently tabulated or is of doubtful reliability.

From analysis of system operating records and reports, present values have been estimated for most of the recommended performance indicators as shown in Table 1-4. On the basis of this estimated performance and known industry performance, target values are suggested which should be achievable by the Special Services Program over time.

Implementation of reliable data collection procedures and a regular monthly monitoring program must precede the setting of annual target values for the system. On the basis of several months' data, target indicator values should be established to seek incremental improvement

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\*The twelve peer systems are the special transportation programs sponsored by Atlanta, Baltimore, Bi-State, Boston, Cleveland, Denver, Los Angeles (City), Metropolitan Dade County (Miami), Milwaukee, Minneapolis, SEPTA, (Philadelphia), and Tri-Met (Portland).



TABLE 1-4  
ESTIMATED PERFORMANCE INDICATOR  
VALUES AND TARGET VALUES

	Present CTA Performance	Target	
Passengers Per Vehicle Service Hour	1.8	2.5	
Scheduled Trips as Percent of Total Requests	87.4%	90%	
No-Show Passengers as Percent of Total Booked Trips	1%	1%*	maintain
Late Cancellations as Percent of Total Booked Trips	5%	5%*	maintain
Total Lift Users as Percent of Total Passengers	48%	**	
Total Wheelchair Users as Percent of Total Passengers	44.7	**	
Gross Operating Costs Per Vehicle Service Hour	\$45.60	\$45.63	
Gross Operating Cost Per Passenger	\$26.67	\$18.25	
Platform Hours as Percent of Vehicle Service Hours			
Percent of Pickups On-Time	73.7%***	90%	
Average Trip Travel Time			
Total Vehicle Miles Per Roadcall			
Accidents Per Million Vehicle Miles			

\*System performance good, maintain level.

\*\*Indicator is explanatory of system performance, target value is inappropriate

\*\*\*Statistic based on CTA 20-minute window rather than industry standard of 15 minutes.



rather than define an "ideal" performance level. As an example, the estimated present system productivity of 1.8 passengers per vehicle service hour would lead to a realistically attainable target of 2.0 passengers per vehicle hour and not to the theoretically-attainable 2.5 passengers per vehicle service hour. The setting of attainable targets allows the periodic satisfaction of achieving those targets and permits fine-tuning the targets according to the system's actual performance.

#### Performance Monitoring Process

In order to be timely and effective, the performance monitoring process and attendant responsibilities must be clearly defined and adhered to. The necessary data must be tabulated and reported on time and according to specified procedures. As the data becomes available, the selected performance measures will be computed and their values analyzed against prior performance and trends as well as against comparable systems, if any are identified. Findings from this analysis must be reported through specific channels within the CTA organization along with data on any recommended and/or enacted system changes to improve performance.

CTA's Route & Systems Planning section is seen as filling a key role in the process, computing and working with Special Services management to analyze the resulting indicator values. This key role is appropriate because of the relatively independent position of Route & Service Planning with regard to management of the Special Services program and the experience of that section with quantitative and comparative service evaluations.

Once computed, analyzed, and appropriate actions taken, the monthly performance monitoring report should be forwarded up the CTA organization to keep them aware of Special Services' performance and management actions. Properly used, the performance monitoring report will prevent any operating surprises at higher levels in the CTA organization and will highlight operating, cost, and passenger trends as they develop.



### Note on Evaluating Performance Indicators

An attractive use of performance indicators is to assign a target or "acceptable" value to each of the indicators and then monthly judge whether the system has done well or poorly against these standards. While this is one of the basic intents of performance indicators, a strong caution needs to be raised concerning overreliance on the indicators and incorrect comparison of values between systems.

In evaluating transit performance, the greatest problem is not the selection of the "best" measures, but that of obtaining the most accurate operating and performance data from which to compute the measures. For a wide variety of reasons -- ranging from simple arithmetic errors to personnel changes -- data can be in error either a little or a whole lot. The potential for error in performance data means that the computed measures need to be used only as indicators or "symptoms" of problems, not as the sole proof of the problem.

Similarly, performance indicators are influenced by many organizational, operational, and environmental factors which usually differ from system to system. For this reason, the same performance indicator value may be considered "good" at one system and "poor" at another. Comparison of performance indicator values is best done on the basis of trend or "longitudinal" analysis for the system itself and only through comparison against other systems with great reservation.





## SECTION 2

### OPERATIONS AND PERFORMANCE

#### OVERVIEW

CTA's Special Services program will begin its fourth year of service in September 1984. Since initiation of service in 1981, the program has doubled its service fleet, registered over 5,700 eligible clients, and provides about 450 one-way passenger trips on an average weekday. At this point, though, the system is faced with a significant unmet demand for service from handicapped residents of Chicago as well as complaints from existing users regarding service quality and responsiveness.

In this context, this section presents a thorough analysis of Special Services operations and performance in a number of specific areas. Subsection 2.1 carries out a detailed analysis of present performance and operating procedures with particular emphasis on scheduling and dispatch, and presents a series of practical recommendations for improved performance and productivity. Subsection 2.2 examines a number of system policies with regard to customers and service quality. System personnel requirements and capabilities are analyzed within Subsection 2.3, and Subsection 2.4 addresses the present and future effectiveness of the computerized scheduling system and suggests possible enhancements. Finally, Subsection 2.5 estimates the operating and capital cost impacts of recommendations made within the preceding analyses.



## SUBSECTION 2.1.1 OPERATING ANALYSIS

### PERFORMANCE STANDARDS

The measure of success, or any inadequacy, of the Special Services Program, or indeed, any special transit program, can be determined, in part, by an examination of several performance criteria. These criteria include:

- productivity
- wait time
- ride time
- cancellations/no-shows
- shared ride vs. single trip scheduling

We have also examined other aspects of the program such as the ability to handle and schedule calls. We have used in our data analysis in most instances, a typical day, February 23, 1984, to analyze the various performance statistics. Of course, since there is the possibility that one day may not be representative, we have compared some of the data against several days statistics, but not necessarily to the same level of detail.

#### Productivity

The standard by which most paratransit systems are measured is by productivity -- the number of passengers carried per vehicle service hour. The most common definition of a vehicle service hour is the time the vehicle leaves the garage until the time the vehicle returns. Unlike fixed-route operations where exact deadhead can be calculated, a paratransit vehicle is considered in service from the time it leaves the garage until the time it returns. This assumption is based upon the theory that the vehicle could conceivably be directed to a pickup shortly after entering into the service area, even though no pickup was scheduled when it left the garage. Therefore, the vehicle is always available for service while in the service area, less any time deducted for operator breaks, lunches, and vehicle breakdown.





The method used to calculate productivity by CTA for Special Services is from the first pickup until the last drop-off. It does not include deadhead time nor does it deduct the time for operator breaks or lunches.

According to data provided by CTA, productivity for the dates 1/19/84, 1/27/84, and 2/23/84 was 1.8, 1.8, and 1.9 passengers per vehicle hour, respectively. The productivity for 2/23/84 was recalculated by deducting non-service hour time (lunches, breaks, breakdowns, etc.), and then calculating deadhead and adding that time to the service hours. Deadhead was estimated to be an additional 45.1 hours. Operator breaks and lunches amounted to 26.8 hours. The net result was that 18.3 hours (45.1-26.8) was added to the service hour total, thereby reducing productivity from 1.9 to 1.8. This is a reduction of approximately 9 percent. We suspect that a recalculation of the other days would reduce productivity down to 1.7.

A productivity rate of 1.7 to 1.8 passengers per vehicle service hour must be considered low when taking into consideration that 40-50 percent of the daily ridership is prebooked. And, since the schedulers are achieving aboveaverage shared ride trips, there are too many non-productive hours.

#### Wait Time

In demand-responsive transit, wait time is defined as the elapsed time between when a customer calls for service until the time they are actually picked up. At Special Services there are two elements of what can be termed "wait time": A patron who has a standing order (subscription service, commonly referred to as a "99"), and the deferred customer who requests a specific time to be picked up. It should be noted that order takers schedule trips using the time the customer wishes to be delivered more so than by the time the customer wishes to be picked up. Nevertheless, it is an indicator of performance to measure the accuracy of when the customer was picked up against when they were promised to be picked up. The industry standard is that a passenger should be picked



up within a 15 minute "window." No more than 10 minutes early nor more than 5 minutes late. This goal should be achieved 90 percent of the time. The criterion utilized by Special Services is somewhat broader, 10 minutes early to 10 minutes late. A passenger picked up within this window is considered on-time.

Illustrated in Table 2-1 is an analysis of on-time performance for three days. The average on-time percentage for the three days is 73.7 percent. Taking into consideration that Special Services consists of all prebooked trips, this percentage must be considered low when compared with industry standards. Naturally, consideration must be given to the fact that Special Services accommodates a large number of wheelchair passengers and that the Chicago weather could be a factor. However, on the days sampled, there were no weather related influences on performance, and similar type Elderly and Handicapped systems perform closer to the industry standard.

In analyzing the data for on-time performance, it is felt that even this 73.7 percent is overstated. There were many examples of operator trip sheets that indicate that they made every pickup and delivery at precisely the time scheduled (see Exhibit 2-1). We find that difficult to accept. There are two possible explanations. Some operators may indicate on the trip sheet that they made the pickup and delivery exactly when scheduled, regardless of when they were actually there. Or, if an operator leaves the time blank, the scheduler puts in the scheduled time when the trip history posting is done. We suspect that it may be a combination of the two. In any event, it highly distorts the data.

An informal poll was taken of several drivers, and the same question was asked of the scheduling staff -- What is the time that the drivers enter in on their stop sheet? (see Exhibit 2-2.) Four different responses were given: (1) the time the driver arrives at the stop; (2) the time the passenger boards; (3) the time the passenger was scheduled; or (4) the time the vehicle departs. Several drivers indicate on their trip sheet two separate times -- the time they arrive, and the time the



TABLE 2-1

## ON-TIME PERFORMANCE

DATE	EARLY				ON-TIME	LATE			
	60 MIN	30 MIN	20 MIN	10 MIN		10 MIN	20 MIN	30 MIN	60 MIN
1-19-84	.6	2.2	1.3	4.1	69.8	10.4	6.3	4.4	.9
1-27-84	.4	1.3	.4	3.5	73.4	12.9	3.0	3.2	1.9
2-23-84	.4	1.0	1.4	4.4	78.0	8.7	3.4	2.3	.4
AVERAGE	.5	1.5	1.0	4.0	73.7	10.7	4.2	3.3	1.1

## DAY OF WEEK

## DATE

Thursday  
Monday  
Thursday

1-19-84  
1-27-84  
2-23-84

EXHIBIT 2-1

CHICAGO TRANSIT AUTHORITY

SPECIAL SERVICES \*\*\*

FINAL TRIP SHEET

PAGE 1

DAY RUN VEH ST RN OPERATOR BADGE QUIT PD/PI  
TUE A57 116 5:35 DAVIS THOMAS 5-308 13:10 10

\* CHECK: FUEL  
\* CALL: NO SHOWS  
\* EXTRA QNS  
\* IN SERV  
\* OUT SERV

NAME	ADDRESS	TC PHONE	HC PASS	S	SB	TIME	ACTUAL	S	ACT	PAS
BISHOP MARY	5327 W GLADYS	W 921-5835	C +1	\$	99	6:05	6:05	X	+1	
PALENCIA JUD	1740 N KARLOV	W 342-0031	W +1	\$	99	6:25	6:25	X	+1	
PFAUSER IREN	4743 W ROSCOE	W 286-3956	C +1	\$	99	6:35	6:35	X	+1	
O'MALLEY MAR	4250 N SAWYER	W 539-2834	C +1	\$	99	6:50	6:50	X	+1	
BLACKETER LO	4515 N KIMBALL	W 267-2957	C +1	\$	99	6:55	6:55	X	+1	
ZIMA DONNA M	3040 N SOUTHPORT	W 248-3598	W +1	\$	99	7:23	7:23	X	+1	
BISHOP MARY	431 W OAKDALE	W 921-5835	C	-1	\$	99	7:25	7:25	X	-1
PFAUSER IREN	1000 W FULTON	W 286-3956	C	-1	\$	99	7:32	7:32	X	-1
PALENCIA JUD	110 N WACKER	W 342-0031	W	-1	\$	99	7:40	7:40	X	-1
O'MALLEY MAR	155 N WACKER	W 539-2834	C	-1	\$	99	7:42	7:42	X	-1
BLACKETER LO	141 W JACKSON	W 267-2957	C	-1	\$	99	7:45	7:45	X	-1
ZIMA DONNA M	160 N LASALLE	W 248-3598	W	-1	\$	99	7:51	7:51	X	-1
OPERATOR	15 MIN BREAK	W 222-6300	+12	\$	99	7:55			+0	
OPERATOR	15 MIN BREAK	W 222-6300			\$	99	8:10		+0	
BIRCHFIELD B	5144 W CULLOM	M 286-2761	C +1	F	0	8:40	8:40	X	+1	
BIRCHFIELD B	111 W OAK ST	M 286-2761	C	-1	F	0	9:10	9:10	X	-1
OPERATOR'S	40 N MIN LUNCH	W 222-6100	+12	\$	99	9:15			+0	
OPERATOR'S	40 N MIN LUNCH	W 222-6100			\$	99	9:55		+0	
SAVAGE JUDY	754 W BELDEN	W 929-6686	W +1	\$	99	10:40			+0	
FRISCH DEAN	3525 W FOSTER	B 478-7040	C +1	Z	0	10:45	10:45	X	+2	
FRISCH DEAN	AL 505 N LASALLE	B 478-7040	C	-1	Z	0	11:30	11:30	X	-2
SAVAGE JUDY	6050 W TOUHY	W 929-6686	W	-1	\$	99	11:40		+0	
BARRETT, MICH	3400 N AUSTIN	E 282-3882	C +1	Z	0	12:15	12:15	X	+1	
BARRETT, MICH	5452 W ADDISON	E 282-3882	C	-1	Z	0	12:20	12:20	X	-1
MILLER NICK	5447 W ADDISON	O 763-4017	C +1	F	0	12:25	12:25	X	+1	
MILLER NICK	6224 N OAK PARK	O 763-4017	C	-1	F	0	12:40	12:40	X	-1

\* \* \* END OF RUN A57 \* \* \*

START MI. FINAL MI. MILES FUEL MI. GAS OIL TOTAL PASS HOURS IN SERVICE  
13,253 13,347 94 0 25 0 11 6.6



EXHIBIT 2-2  
OPERATOR TRIP SHEET

CHICAGO TRANSIT AUTHORITY  
\*\*\* SPECIAL SERVICES \*\*\*  
PRE-PLANNED TRIP SHEET

\* CHECK: FUEL  
\* CALL: NO SHOWS  
\* EXTRA DNS  
\* IN SERV  
\* OUT SERV

GE 1

Y RUN VEH ST RN OPERATOR 02/05/84  
N A56 6:55 LEWIS LUTHER 9-290 14:30 10

ME ADDRESS TO PHONE HC PASS SB TIME ACTUAL S ACT PAS

IST J *	4026 W 53 PL	G 735-0475	8+2	0	7:15	0715
CKSON NEED	1241 W 61ST	W 925-6396	W +1	0	7:30	0730
CKSON NEED	WG 1200 W WASHGT	W 925-6396	W +1	0	7:50	0750
IST J *	77 W WASHINGTON	G 735-0475	41	0	8:00	0800
INTER POLLY	3247 E 91ST ST	G 768-2464	9+1	0	8:30	0830
INE GLADYS	6854 S PAXTON	G 643-4209	C +1	0	8:44	0844
RINGTON MA	5889 S ABERDEEN	G 285-6051	W +2	0	9:05	0905
INE GLADYS	1630 N CLARK	G 643-4209	C -1	0	9:40	0940
RINGTON MA	2454 W NORTH	G 285-6051	W -2	0	9:45	0945
INTER POLLY	234 W CERMAK	G 768-2464	-1	0	10:20	1020
ERATOR	15 BREAK	W 222-6300	+12	99	10:45	1045
ERATOR	15 MIN BREAK	W 222-6300	-12	99	11:00	1100
ERATOR'S	40 N MIN LUNCH	W 222-6100	+12	99	11:05	1105
ERATOR'S	40 MIN LUNCH	W 222-6100	-12	99	11:45	1145
ULKOWSKI RO	5159 S WOOD	R 434-2063	W +2	99	11:50	1150
ULKOWSKI RO	6900 S PULASKI	R 434-2063	W -2	99	12:09	1209
INTER POLLY	2841 N CERMAK	G 768-2464	C +1	0	12:35	1235
INTER POLLY	3247 E 91ST ST	G 768-2464	C -1	0	13:15	1315

~~W 925-6396~~ ~~G 735-0475~~ ~~W 925-6396~~ ~~G 735-0475~~ ~~W 925-6396~~ ~~G 735-0475~~ ~~W 925-6396~~ ~~G 735-0475~~

\*\*\* END OF RUN A55 \*\*\*

START MI. FINAL MI. MILES FUEL MI. GAS OIL TOTAL PABS. HOURS IN SERVICE

80538

80696

P10

W3

L7

passenger boards. This raises the question of what the scheduler enters for trip history posting. These further inconsistencies render the data somewhat inaccurate, if not actually meaningless.

#### Ride Time

Ride time is the elapsed time between when a customer is picked up until the time they are delivered. While this time should not be too short, for it may indicate that "taxi type" service is being offered, it should not be excessively long either. Illustrated in Table 2-2 is a breakdown in 15 minute increments of the ride time for a sample day. Forty-seven percent of all trips were completed in 30 minutes or less and a full 67 percent were delivered within 45 minutes of the time they were picked up. This ratio must be considered good considering the nature of the service. We would, however, make the same overall comment with regard to the data as previously mentioned: far too many trips are delivered exactly to the minute of when they were scheduled.

#### Cancellations

On February 23, 1984, 530 trips were scheduled. Of this total, there were 126 ridership adjustments. These adjustments included extra on's, no shows and cancellations. After deducting the 13 extra on's, there were 113 no shows, cancellations, and various trip adjustments. This amounts to 22 percent of the total trips booked being changed in one way or another. Because the computer continues to list all adjusted trips in vehicle tours, this volume of adjustment significantly complicates the schedulers' task due to extraneous data. The number of no shows was limited to five and does not appear to be a problem. Analysis of other days data reveals that the number of trip adjustments do pose a major problem. (See Table 2-3). In fact, adjustments on January 19, 1984 amounted to 30 percent of the total ridership.

Trip adjustments are broken down into categories and designated by code as shown in Table 2-4. The different types of cancellations are:



TABLE 2-2  
RIDE TIME  
FEBRUARY 23, 1984

<u>MINUTES</u>	<u>TRIPS</u>	<u>PERCENT</u>		
0-15	93	21	}	47%
16-30	117	26		
31-45	90	20		
46-60	56	12	}	67%
60-74	43	10		
75-89	23	5		
90-120	16	4		
2 Hrs +	<u>10</u>	<u>2</u>		
Total Trips Sampled	448	100		



TABLE 2-3

## ADJUSTMENTS/CANCELLATIONS/NO SHOWS

<u>DATE</u>	<u>NO SHOWS</u>	<u>ADJUSTMENTS AND CANCELLATIONS</u>	<u>TRIPS SCHEDULED</u>	<u>PERCENT</u>
1-19-84	1	192	643	30%
1-27-84	10	121	551	24%
2-23-84	5	113	530	22%

## ADJUSTMENTS/CANCELLATIONS BY USER TYPE

<u>DATE</u>	<u>TOTAL ADJUSTMENTS AND CANCELLATIONS</u>	<u>REGULAR</u>	<u>LIFT</u>
1-19-84	192	120	72
1-27-84	121	78	43
2-23-84	113	71	42





TABLE 2-4  
RIDERSHIP ADJUSTMENTS

February 23, 1984

<u>CODE</u>	<u>DESCRIPTION</u>	<u>TOTAL</u>
A	Cancel until further notice	17
B	Cancel (benefit of CTA)	14
C	Cancel normal day of service	27
E	Early cancel	26
F	Final cancel of subscription	1
G	General adjustment	23
N	No show	5
Y	Extra on	<u>13</u>
	TOTAL	126
	Less Extra On's	<u>13</u>
	Total No shows, Cancellations, and Adjustments	113



DAVE CONSULTING, INC.

- "A" - used to designate cancellations until further notice on subscription passengers
- "B" - benefit of CTA, (e.g. breakdown, overbooking, etc.)
- "C" - trip cancelled less than four hours prior to pickup
- "E" - trip cancelled more than four hours prior to pickup
- "G" - general adjustment -- trip cancelled due to incorrect address, or a trip booked that a customer could not accept.

On the day sampled, February 23, 1984, there were 23 "G" type cancellations. In instances where a trip was cancelled due to an incorrect address and rebooked, it somewhat distorts the ratio of cancellations. It is not known how many "G" cancellations were included in the other days illustrated in Table 2-3. Eliminating this type of cancellation would reduce the percentage slightly. Perhaps, in order to qualify and give relevant meaning to the issue of cancellations, it is necessary to eliminate more than just the "G" type cancellations. For example, on our analysis day of February 23, 1984, the total ratio of ridership adjustments was twenty-two percent. If we take into consideration only those individuals who cancelled on the scheduled day of service (Code C), this would reduce the number to 27 cancellations or five percent of the total ridership. This percentage conforms to normal industry standards and places the actual number of cancellations in proper perspective.

In our analysis of cancellations and trip adjustments, we noted that subscription trip holders are allowed to place their "99" trips on indefinite cancellation until further notice. On the day detailed in Table 2-4, 17 subscription trips were identified as "A" cancellations, cancelled until further notice. It is common practice for subscription trips to be temporarily suspended while individuals are on vacation, sick, or possibly in the hospital, yet it is not common to allow such cancellations to be indefinite. The effect of the indefinite "A" cancellation is to effectively reserve the client's subscription trip until they are able to or desire to use it again, and consequently preventing another client from moving off the waiting list into a subscription trip.



### Shared Ride

A measure of success in paratransit operations can be determined by the number of shared rides that are provided. The goal of every demand-responsive, or special services program, should be to avoid the "taxi" type trip that picks up one passenger and takes them directly to their destination. While this is highly desirable from a user standpoint, it is grossly inefficient. The goal then is to pickup as many passengers that are travelling in the same general direction and to deliver them in and amongst other pickups and deliveries. This, of course, should be accomplished while meeting the promised pickup and delivery times. An analysis of shared and single type rides is illustrated in Table 2-5. Of the total trips sampled, seventy percent had the element of a shared ride associated with it. This is a high ratio and reflects favorably upon the scheduling staff and their ability to make this element of the service as efficient as possible.

### LEVELS OF SERVICE

There are three types of service offered by Special Services -- subscription, deferred, and immediate response. Subscription service is comprised of those individuals who have a standing order to be picked up at the same time on designated days. This may be from three days per week to up to seven days per week. In order to qualify for subscription service, a passenger must make at least three scheduled trips per week between the same origin and destination. Advance reservation, or "deferred," is a request that is taken for a particular time for one day only. These calls are accepted the previous day. The goal of Special Services is to have a 50-50 balance between subscription and deferred service. Additional passengers can only be added to the subscription list as a result of another passenger vacating the list. Illustrated in Table 2-6 is a breakdown of the number of clients, by area, waiting to be placed on the subscription list. Also included is an accompanying map (Exhibit 2-3) to identify the areas geographically. The southern areas, designated areas 5, 6, and 7, account for approximately 53 percent of the total. Several of the 236 passengers on the waiting list have been on the



TABLE 2-5

## SHARED RIDE VS. SINGLE TRIP SCHEDULING

<u>TYPE RIDE</u>			<u>TYPE RIDE</u>		
<u>RUN</u>	<u>SHARED</u>	<u>SINGLE</u>	<u>RUN</u>	<u>SHARED</u>	<u>SINGLE</u>
A56	6	1	A84	11	1
A57	9	2	A85	0	4
A58	10	2	A86	4	3
A59	12	0	A87	7	3
A60	6	3	A88	6	2
A61	10	3	A89	9	4
A62	5	6	A90	9	1
A63	8	3	A91	4	2
A64	9	2	A92	4	3
A65	13	0	A93	10	3
A66	6	8	A94	9	5
A67	5	5	A95	9	4
A68	2	6	A96	14	0
A69	2	2	B72	2	2
A70	4	4	B74	4	2
A71	6	5	B76	3	2
A72	9	1	B77	2	4
A73	9	6	B78	9	0
A74	5	2	B79	2	2
A75	4	3	B80	2	3
A76	4	1	B81	0	2
A77	3	3	B82	5	1
A78	6	0	B83	7	2
A79	5	0	B84	8	0
A80	3	2	B85	7	1
A81	3	2	S56	0	3
A82	2	1	S69	2	1
A83	3	4			
			TOTAL	318	136
			PERCENT	70	30

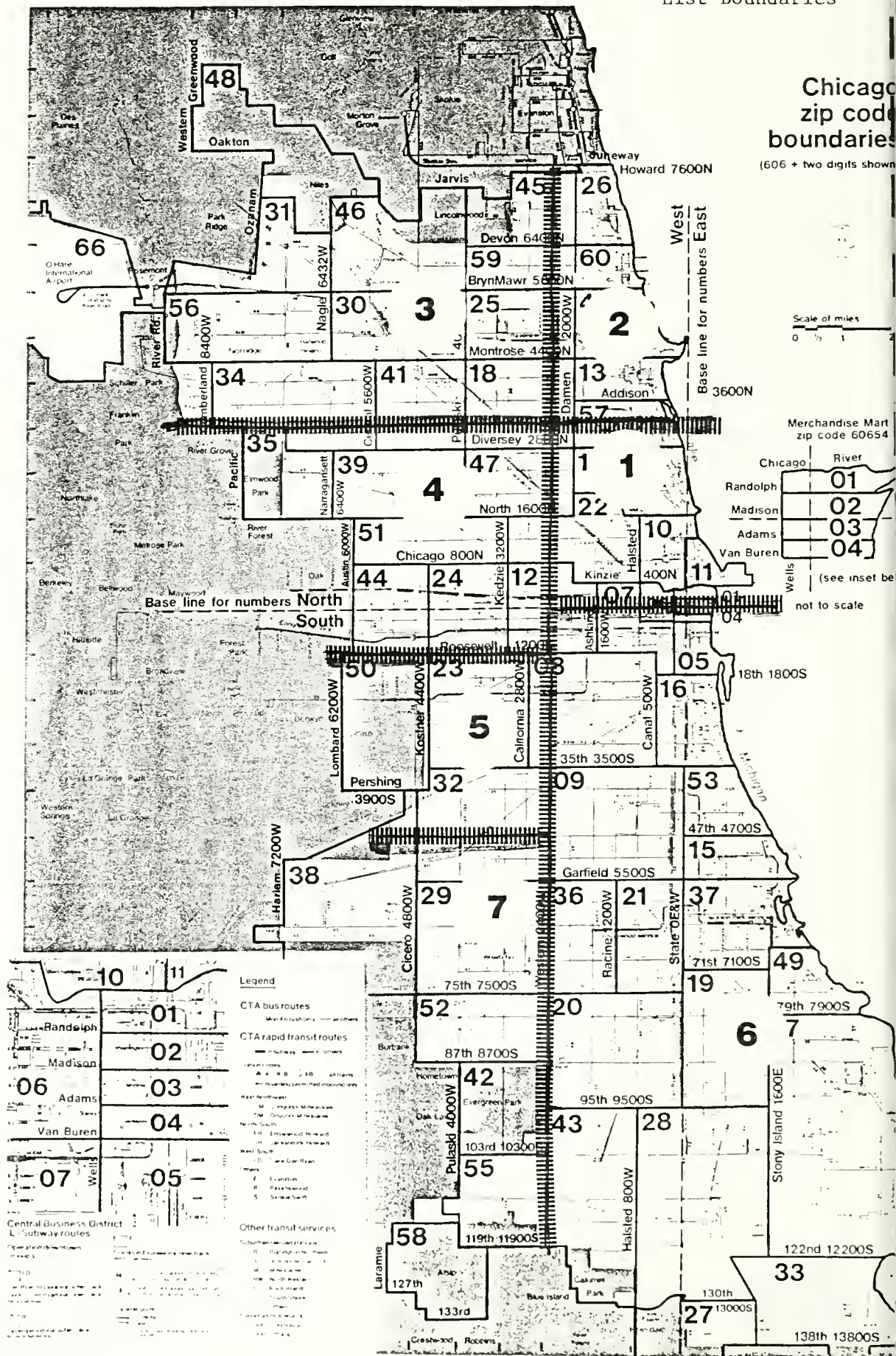
TABLE 2-6

## SUBSCRIPTION WAITING LIST

<u>Area</u>	<u>No. of Clients</u>	<u>Percent</u>
1 (Near North)	21	9
2 (Far North)	26	11
3 (Northwest)	45	19
4 (West)	20	9
5 (Southwest)	28	12
6 (Near South)	53	22
7 (Far Southwest)	<u>43</u>	<u>18</u>
TOTAL	236	100







list since the inception of the service in September of 1981. An analysis of the first four individuals on each list reveal that the average waiting time has been in excess of 2 years (see Table 2-7).

The last type of service, and one that is used very infrequently, is accepting requests for immediate demand-responsive service. This type of request is accommodated, not by the schedulers, but by the dispatchers. A typical example of filling this type of service is whenever the dispatcher receives a cancellation, or a no-show, they will frequently review the requests of patrons who were unable to be scheduled and attempt to accommodate their trip. This usually occurs rather infrequently, once or twice a day.

#### ORDER TAKING PROCEDURES

Passengers not on the subscription list wishing to place a request for transportation must call in the previous day. The hours of operation to request a ride are from 8:00 a.m. to 4:00 p.m. The procedures are to accept requests starting at 8:00 a.m. Once calls are received, the scheduling takes place and continues throughout the day. At approximately 4:00 p.m., the following day's schedule is complete and customers call back to confirm that their trip was scheduled. If the trip was able to be booked, the scheduler will notify the customer of the time for both the initial pickup and the return trip. The primary purpose of the scheduler working until 6:40 p.m. is to accommodate this notification process. After 6:40, clients calling to verify their trip will be handled by the division clerk.

The specifics of the order taking process are as follows:

#### Telephone Answering Procedures

Schedulers begin to accept telephone calls at exactly 8:00 a.m. Requests for service continue throughout the day until approximately 3:00 p.m, however, the majority of requests are received during the first hour of the morning. All available schedulers, including the assistant





TABLE 2-7

## LENGTH OF TIME ON WAITING LIST

<u>Area</u>	<u>Position on List</u>	<u>Waiting Since</u>
1	1	09-01-81
	2	09-20-81
	3	10-02-81
	4	10-31-81
Area 2	1	11-12-81
	2	11-13-81
	3	11-18-81
	4	11-22-81
Area 3	1	09-01-81
	2	09-30-81
	2	11-05-81
	4	12-01-81
Area 4	1	11-29-81
	2	11-29-81
	3	12-08-81
	4	12-22-81
Area 5	1	01-02-82
	2	01-05-82
	3	01-09-82
	4	01-25-82
Area 6	1	12-27-81
	2	01-12-82
	3	01-17-82
	4	03-01-82
Area 7	1	10-05-82
	2	10-15-82
	3	10-27-82
	4	11-01-82



superintendent, participate in the accepting of requests. On occasions, when staff is short-handed, other personnel from the garage may be called to assist. Since no scheduling of trips is made at this time, it is a relatively simple process. The entire process can be completed in 20-30 seconds. Since the overwhelming majority of passengers are repeat customers, they understand the process and respond quickly to the prompting of the scheduler.

The scheduler completes the Special Services Passenger Trip Report (Exhibit 2-4) as follows:

- Writes in appropriate date (the date is often pre-stamped to economize time).
- When the scheduler answers the phone, the time, including seconds, is inserted in the time slot (as illustrated in our example as 08:26:55).
- The scheduler then asks the customer for their phone number and types it into the CRT. The screen will then be displayed with the customer's name and address. (If no name appears, the customer is not registered and is referred to the proper registration authority.)
- The scheduler then verifies that the customer is Mrs. Hawkins of 4856 South Indiana. If the response is affirmative, the customer is asked the destination of their trip, the number of passengers, and the time they wish to be delivered. Although trip purpose and if the customer is in a wheelchair is programmed in, this information is usually verified.
- The call is then terminated and the customer is instructed to call back after 3:00 p.m. The customer can also request that Special Services call them.
- The scheduler places this request in an in-basket and takes another call.

This entire process can be completed in less than 20-30 seconds.



J.U. SEQ: 135  
17

If yes: May I have your home phone number? 624-0172 Name HAWKINS ORZC  
(Last) (First)

Address: 4856 S INDIANA

Trip Code M Wheelchair? NO Passengers 1 One way    Return requested   

Scheduled For:				Requested		Scheduled For:			
Run	PU	DO	Appt. Time	Address		Leave Time	Run	PU	DO
1	1300		1.	2224 S WENTWORTH		1400	1	1300	
			2.						
			3.						
			4.						
			5.						

Your request will be handled in the time order in which it was received. We will know at approximately 3:00 p.m. whether or not we will be able to accommodate you. Shall we call you?

☒ Call client at \_\_\_\_\_ ☐ Client will call back. Thank you for calling.

Scheduling History							
Scheduled		Unable to Schedule					
Time	By	Time	By	Time	By	Time	By
1541	LWJ						

[illegible]

### Trip Request Processing

At approximately 8:20, the assistant superintendent collects the trip requests that have been received thus far. At this point, approximately 100 calls will have been received. On a typical day, this represents 50% of the total calls that will be taken for the entire day.

The assistant superintendent arranges the trip requests in chronological order and numbers them consecutively from one through the total number of requests. The requests are then separated by geographical area (north and south) and distributed back to the staff for scheduling. By 9:00 approximately 89% of the total incoming calls have been received, and the remaining part of the day will be dedicated to the scheduling of trips.

#### 1. Requested versus Actual Pickup

With approximately 50 percent of all trips allocated to subscription passengers, the scheduler must schedule the regular advance requests around those already pre-booked. While we recognize that this is not an easy task and we do not wish to be overly critical, the percent of occurrences that trips are booked reasonably close to the requested time are minimal. Perhaps the goal, or customer satisfaction should be that service was able to be provided at all. However, we did attempt to analyze performance from the standpoint of when the customer requested to be delivered against the time they were actually delivered. Of 58 trips analyzed, only 21 had sufficient data to enable this evaluation. Of the total, 64 percent either had no delivery time listed by the operator, or the entire trip sheet indicated that every pickup and delivery was made exactly when scheduled. On one trip sheet, 11 pickups were made at the same address with 11 different pickup times. This type of recordkeeping renders any evaluation of performance meaningless.

Of the 21 trips that we were able to analyze, approximately one-third were actually delivered within a 20-minute window (10 minutes early to 10 minutes late) of the requested time (see Table 2-8).



TABLE 2-8

REQUESTED DELIVERY TIME  
vs  
SCHEDULED DELIVERY TIME  
vs  
ACTUAL DELIVERY TIME

<u>Requested Delivery</u>	<u>Scheduled Delivery</u>	<u>Actual Delivery</u>	<u>Variance<sup>1</sup></u>
10:00	10:25	10:28	-28
10:45	10:15	10:20	+25
13:00	12:45	12:52	+ 8
09:00	09:00	09:03	- 3
08:30	07:17	08:40	-10
13:00	12:55	12:55	+ 5
09:00	09:20	09:20	-20
14:00	13:45	13:50	+10
07:00	07:00	07:00	0
14:30	14:25	13:35	+55
10:00	09:55	09:41	+19
11:30	11:00	11:15	+15
14:45	14:45	14:36	+ 9
09:00	09:07	09:11	-11
09:30	08:50	09:43	-13
06:30	06:05	06:05	+25
10:00	09:20	09:10	+50
08:00	07:20	07:20	+40
13:00	12:20	12:20	+40
10:00	09:40	10:12	-12
10:00	10:00	09:52	+ 8

Percent within 10 minutes, early/late = 33.3%

<sup>1</sup>The difference between actual delivery vs. requested delivery.



The number and type of trips were examined for February 23, 1984. There were approximately 530 trips scheduled, 212 subscription (40 percent) and 318 advance reservation (60 percent). Of this total, there were approximately 126 adjustments, such as cancellations, no-shows, extra-ons, etc. See Tables 2-4 and 2-9.

## 2. Scheduling Procedures

In order to facilitate the booking of trips, the schedulers have at their disposal computerized data to assist them in their endeavors. The computer does not actually schedule trips but provides a file of information to assist in the scheduling process. The scheduling of trips is based upon the schedulers' knowledge of the service area, and the structure of the runs and the current list of subscription riders.

As previously mentioned, schedulers will book trips by area on a rotating basis. Listed as Exhibits 2-5 and 2-6 are lists of the runs assigned to the north and south. There are also references as to which vehicles travel from north to south and south to north.

The first step, if the scheduler does not know the location of the client's address is to look them up on the map. Once verified, 2 minutes per block is used to estimate travel time. This, of course, will be modified if the ride will be shared.

The booking of advance reservation trips will be based upon the number and time of subscription trips (99s). For example, if the scheduler pulls up run A56 (see Exhibit 2-7), they will see when all the 99s are scheduled. (Our example is after the fact and shows the advance reservation schedule that day, identified as 0 under the heading SB.) Our scheduler would see that the first subscription trip is for 6:15 but is cancelled as indicated by the letter "A" to the right. Our next prescheduled trip is for 6:30. Looking at the heading under ST RN (Start Run), our scheduler will find that the vehicle is available to leave the garage at 5:25 and a trip prior to 6:30 could be accommodated on this run. This same procedure is used throughout the day.





TABLE 2-9  
SUBSCRIPTION/ADVANCE RESERVATION TRIPS BY RUN  
February 23, 1984

<u>Run</u>	<u>Subscription</u>	<u>Advance Reservation</u>	<u>Total</u>
A56	3	10	13
A57	7	7	14
A58	7	7	14
A59	6	9	15
A60	4	7	11
A61	6	7	13
A62	7	9	16
A63	7	9	16
A64	11	3	14
A65	8	8	16
A66	3	6	9
A67	1	13	14
A68	0	7	7
A69	3	5	8
A70	3	9	12
A71	5	10	15
A72	6	5	11
A73	2	16	18
A74	6	2	8
A75	2	6	8
A76	6	1	7
A77	2	5	7
A78	6	0	6
A79	6	2	8
A80	0	7	7
A81	3	4	7
A82	0	6	6
A83	4	3	7
A84	0	14	14
A85	0	4	4
A86	7	5	12
A87	5	7	12
A88	9	3	12
A89	9	6	15
A90	4	7	11
A91	1	9	10
A92	0	9	9
A93	9	7	16
A94	9	5	14
A95	7	8	15
A96	0	20	20
B72	0	4	4
B74	0	6	6
B76	2	4	6
B77	3	3	6
B78	5	8	13
B79	4	2	6
B80	4	3	7
B81	4	1	5
B82	6	2	8
B83	7	3	10
B84	4	4	8
B85	7	4	11
Subtotal	230	331	561
Less Cancellations	-18	-13	-31
Total	212	318	530
Percent	40%	60%	





## EXHIBIT 2-5

## NOTES

A57	0535	1320			
A59 N/S	0545 N/S	1340			
A60	0551	1342			
A61	0601	1346			
A63	0605	1350			
A64	0607 S/N	1352			
A65	0610	1355			
A66	0615	1400			
A69	0655	1440			
A78	0625	0940			
A79	0645	1020			
A80	0745	1130			
A83	0725	1100			
A85	0850	1215			
A89	1220	2000			
A93	1352	2137			
A95	1425	2205			
A91	1346	2131	B72	1330 S/N	1700
			B78	1355	1825
A75	1005	1805	B79	1430	1830
A86	1050	1900	B80	1440	1830
			B81	1430	1835
			B82	1350	1840
			B83	1440	1850

## SOUTH

19

EXHIBIT 2-6

## NOTES

A56	0525	1310		
A58	0535	1330	West	or East Subtra
A59	0545 S/N	1340	West	or East Subtra
A62	0603	1348		
A64	0607 N/S	1352	West	to East Add
A67	0620	1405		
A70	0715	1500	North	to North Subtra
A71	0720	1600	South	to South Subtra
A72	0600	1015	North	to South Add
A74	0615	1000		
A76	0559	0915		
A77	0655	1050		
A81	0650	1030		
A82	0905	1200		
A84	0800	1145		
A87	1200	1940		
A88	1215	2000		
A90	1340	2125	B72 N/S	1330 1700
A92	1348	2133	B74	1400 1800
A94	1410	2150	B76	1342 1812
			B77	1405 1815
A73	0940	1725	B84	1500 1900
			B85	1450 1900

02/14/84  
 DAY RUN VEH ST RN OPERATOR BADGE GUIT PO/PI  
 TUE A56 107 5:25 BRUDNEY E. T. 5-835 13:00 10

NAME	ADDRESS	TC PHONE	HC PASS	S	SB TIME	ACTUAL S	ACT PAS
HUCKS LeDORA	555 E 33RD PL	W 225-1792	C +1	J	0 5:45	5:45 X	+1
HUCKS LeDORA	600 W. MADISON	W 225-1792	C	-1	J	0 6:00	6:00 X
GLENN WALTER	9611 S DOBSON	M 374-8537	C +1	\$	99 6:15	A	+0
COLLINS CLAR	7140 S RHODES	W 994-8204	K +1	J	0 6:25	6:25 X	+1
WILSON CAM	7318 S RHODES	W 723-2848	C +1	J	0 6:27	6:27 X	+1
PARKER ODIE	7522 S VERNON	M 723-6437	+1	\$	99 6:30	6:30 X	+1
WILSON CAM	230 S DEARBORN	W 723-2848	C	-1	J	0 7:00	7:00 X
COLLINS CLAR	121 N. LASALLE	W 994-8204	K	-1	J	0 7:08	7:08 X
GLENN WALTER	251 E CHICAGO	M 374-8537	C	-1	\$	99 7:21	A
PARKER ODIE	251 E CHGO	M 723-6437	-1	\$	99 7:22	7:22 X	-1
JACKSON REG	4037 S FEDERAL	W 268-9035	W +1	J	0 7:40	7:40 X	+1
ROBINSON PAM	932 W 50TH ST	W 285-7268	W +1	\$	99 7:50	8:05 X	+1
ROBINSON PAM	6033 S WENTWORTH	W 285-7268	W	-1	\$	99 7:55	8:15 X
JACKSON REG	6033 S WENTWORTH	W 268-9035	W	-1	J	0 7:56	8:17 X
BARBOZA WILL	1642 W 62ND ST	E 436-3845	W +1	T	99 8:10	8:20 X	+1
LES YAU SUN	518 W 32ND ST	W 225-0862	K +1	T	99 8:25	8:30 X	+1
BARBOZA WILL	30 E LAKE	E 436-3845	W	-1	T	99 8:45	8:50 X
LES YAU SUN	443 N WABASH	W 225-0862	K	-1	T	99 8:57	9:00 X
OPERATOR'S	40 N MIN LUNCH	W 222-6100	+12	\$	99 9:10		+0
OPERATOR'S	40 MIN LUNCH	W 222-6100	-12	\$	99 9:50		+0
KIDWELL ESTH	2951 S KING DR	W 326-4022	C +1	J	0 10:00	9:50 X	+1
KIDWELL ESTH	8 S MICHIGAN	W 326-4022	C	-1	J	0 10:10	10:15 X
OPERATOR	15 BREAK	O 222-6300	+1	\$	99 10:20		+0
OPERATOR	15 MIN BREAK	O 222-6300	-1	\$	99 10:35		+0
PILARS HAZEL	400 E 33 ST	W 326-3972	C +1	\$	99 10:50	10:40 X	+1
PILARS HAZEL	225 E 57TH ST	W 326-3972	C	-1	\$	99 11:00	11:00 X
GREGORY GLAD	8523 S COLFAX	W 375-6699	C +1	U	0 11:20	11:25 X	+1
TURNER, THELM	8016 SO ELLIS	M 483-0259	A +1	U	0 11:30	11:40 X	+2
DAVIS MAE	4747 S KING DR	M 536-7843	C +1	U	0 11:45	11:50 X	+1
DAVIS MAE	3400 S INDIANA	M 536-7843	C	-1	U	0 11:55	12:10 X
TURNER, THELM	2600 S MICHIGAN	M 483-0259	A	-1	U	0 12:00	12:20 X
GREGORY GLAD	2 N RIVERSIDE	W 375-6699	C	-1	U	0 12:30	12:40 X

\* \* \* END OF RUN A56 \* \* \*

START MI. FINAL MI. MILES FUEL MI. GAS OIL TOTAL PASS. HOURS IN SERVICE  
 28,657 28,757 100 0 22 0 14 6.9

EXHIBIT 2-7

It is possible to modify the times of 99's slightly to accommodate other trips. Once a trip is scheduled, it is possible that another scheduler may wish to modify already booked trips. When this occurs, the scheduler wishing to make the change will ask the scheduler of the original trip if this can be accomplished. Schedulers also have the ability to reschedule the operator's lunch period (40 minutes) and break (15 minutes). According to the operators' labor agreement, a thirty-minute lunch must be scheduled within five and one-half hours of the start of the shift.

Scheduling of trips is a task that involves, in our opinion, intelligence, spacial perception, and, in the manner that it is accomplished at CTA, an excellent memory. This being the case, the skill level and competence of this task varies among the scheduling staff. Illustrated in Exhibit 2-10 is the number of trips scheduled for each scheduler during a selected week.

It is the policy of Special Services to have two other schedulers try to book a trip if the first attempt was unsuccessful. At the end of the day, the assistant superintendent along with all schedulers review the entire day's scheduling for verification and improvement, before the schedule is printed. Once printed, the next day's schedule is given to dispatch. Any further changes or modifications hereafter are handled strictly by dispatch.

#### Availability of Service

It is estimated that there are 19,160 potential users of the system with approximately 5,706 actually registered (as of 4-24-84). In addition to the regular subscription riders, service is accommodated to an average of 175 daily passengers who must call in for a ride. What is the likelihood that a caller will be successful in obtaining a ride? Illustrated in Table 2-11 is an analysis of the ratio of the ability to meet all requests. The average weekly accommodation rate is 73.5 percent.

Logging of service requests begins at 8:00 a.m. and continues throughout the day. As shown in Figure 2-1, requests for service rapidly decrease during the 8:30 to 9:00 hour and few are received during the remainder of the day. We have analyzed an entire day's requests as shown



TABLE 2-10  
NUMBER OF TRIPS BOOKED BY SCHEDULERS

		SCHEDULER						
		<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>#5</u>	<u>#6</u>	<u>#7</u>
Date	2-13	20	36	21	-	17	-	31
	2-14	18	26	-	27	22	15	22
	2-15	15	32	-	26	14	19	34
	2-16	14	31	19	27	-	12	41
	2-17	-	-	16	-	-	20	29
	2-20	16	35	16	22	22	-	-
	2-21	15	41	16	22	19	-	-
	2-22	18	36	18	28	28	-	-
Average Per Day		17	34	18	25	20	17	31





TABLE 2-11  
PASSENGER TRIP REQUEST/SERVICE FULFILLED

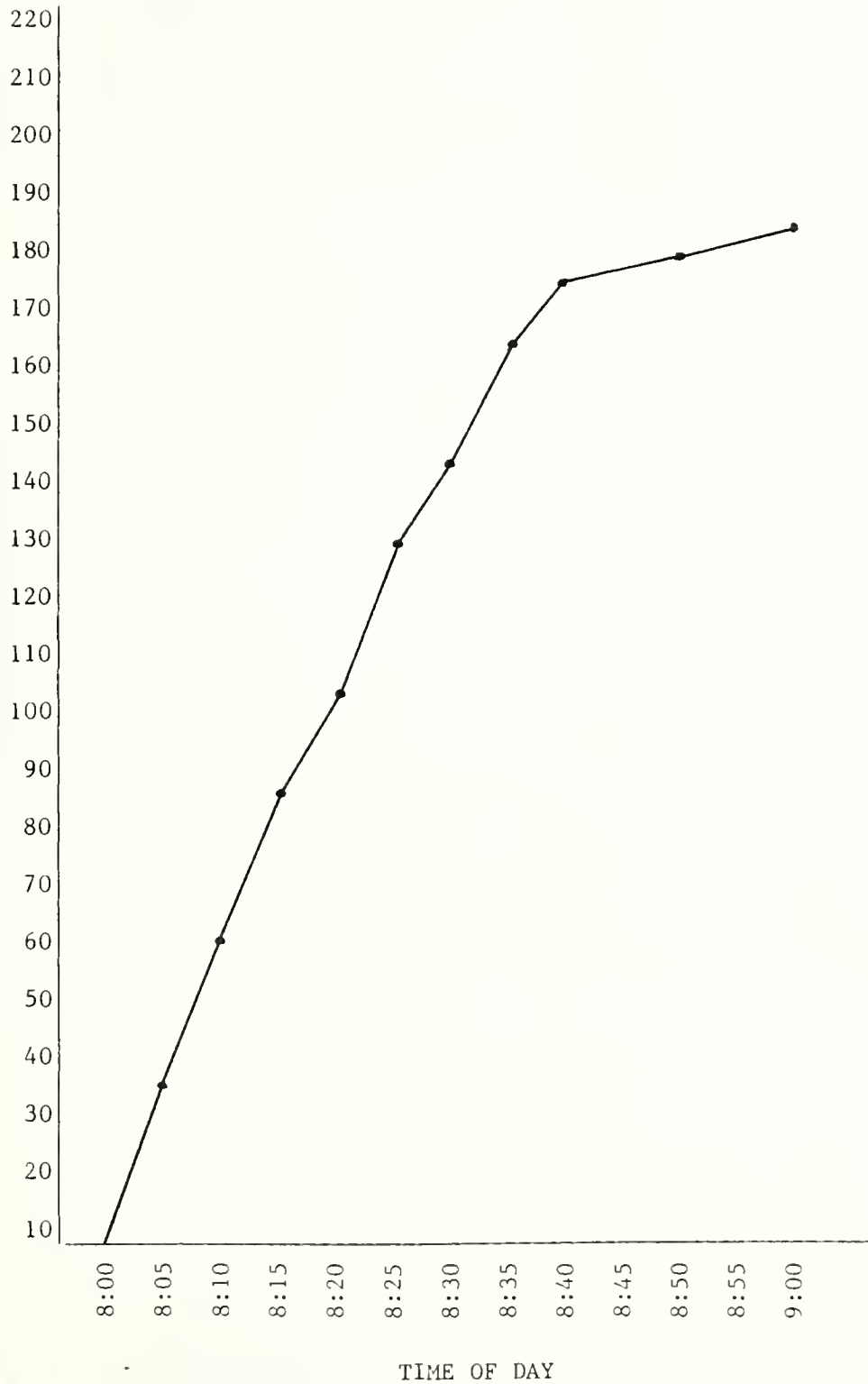
<u>Day of Week</u>	<u>Date</u>	<u>Request for Service</u>	<u>Scheduled</u>	<u>Unable to Schedule</u>	<u>Percent Scheduled</u>
Monday	2-13-84	163	124	39	76.1
Tuesday	2-14-84	167	130	37	77.8
Wednesday	2-15-84	190	140	50	73.7
Thursday	2-16-84	212	144	68	67.9
Friday	2-17-84	74	65	9	87.8
Saturday	2-18-84	113	91	22	80.5
Sunday	2-19-84	125	114	11	91.2
Monday	2-20-84	161	113	48	70.2
Tuesday	2-21-84	153	117	36	76.5
Wednesday	2-22-84	204	142	62	<u>69.6</u>
Average					75.5
Weekday Average		166	122	44	73.5
Saturday Average		113	91	22	80.5
Sunday Average		125	114	11	91.2





FIGURE 2-1

NUMBER OF CALLS RECEIVED BY TIME OF DAY



in Table 2-12. It is obvious that the sooner a customer can call in the higher their chances of booking a ride. On the day sampled, the first 75 callers all received rides. It should be noted that these calls were taken in the first 13 minutes. The ratio begins to fall rapidly. In fact, if a customer call is taken after 8:25, their chance of obtaining a ride is less than 50 percent and decreases rapidly thereafter (see Table 2-13).

#### STAFFING

The staffing for the Special Services scheduling group consists of one superintendent and eight schedulers. The work day begins at 8:00 a.m. and ends at 4:40 p.m., with a 40-minute lunch (see Exhibit 2-8). One of the schedulers works from 10:00 a.m. to 6:40 p.m. Since service is scheduled seven days a week, scheduling staff are on-duty seven days a week. Because scheduling is accomplished one day in advance, planning trips on Sunday is necessary for the Monday schedule. Therefore, the majority of schedulers work Sunday through Thursday, with a lighter schedule on Friday and Saturday.

The majority of the work performed is between the hours of 8:00 a.m. and 3:00 p.m. During this time, requests for service are taken, and trips are booked. The major responsibility of the individual working the 10:00 a.m. to 6:40 p.m. shift is to contact and receive calls after 4:00 p.m. of those individuals who requested a trip that day.

All scheduling staff are trained in all functions of the scheduling control room. Those duties include:

- Answering the telephone and taking passenger trip requests.
- Scheduling of passenger trips.
- Call back of passengers to confirm or deny request for service.
- Trip history posting.

Although all dispatch staff are cross-trained, inevitably the skill level varies and those individuals who develop more competence do the majority of the critical functions such as scheduling and trip history posting.



TABLE 2-12  
PASSENGER TRIP REQUEST  
ANALYSIS OF REQUESTS  
February 22, 1984

Call No.	Time	Scheduled	Call No.	Time	Scheduled	Call No.	Time	Scheduled	Call No.	Time	Scheduled
1	8:00:00	Yes	26	8:03:10	Yes	51	8:08:00	Yes	76	8:13:15	Yes
2	8:00:00	Yes	27	8:03:10	Yes	52	8:08:16	Yes	77	8:13:52	Yes
3	8:00:00	Yes	28	8:03:10	Yes	53	8:08:21	Yes	78	8:14:00	Yes
4	8:00:00	Yes	29	8:03:44	Yes	54	8:08:23	Yes	79	8:14:22	Yes
5	8:00:00	Yes	30	8:04:00	Yes	55	8:08:49	Yes	80	8:14:20	Yes
6	-	Yes	31	8:04:10	Yes	56	8:09:00	Yes	81	8:14:40	Yes
7	-	Yes	32	8:04:10	Yes	57	8:09:09	Yes	82	8:14:49	Yes
8	-	Yes	33	8:04:28	Yes	58	8:09:10	Yes	83	8:14:49	Yes
9	-	Yes	34	8:04:30	Yes	59	8:09:25	Yes	84	8:14:58	Yes
10	8:00:00	Yes	35	8:04:33	Yes	60	8:09:50	Yes	85	8:15:10	No
11	8:00:02	Yes	36	8:05:02	Yes	61	8:10:00	Yes	86	8:16:00	Yes
12	8:00:00	Yes	37	8:05:10	Yes	62	8:10:08	Yes	87	8:16:10	Yes
13	8:00:00	Yes	38	8:05:19	Yes	63	8:10:10	Yes	88	8:16:16	Yes
14	8:00:00	Yes	39	8:05:40	Yes	64	8:10:20	Yes	89	8:16:25	Yes
15	8:00:00	Yes	40	8:05:55	Yes	65	8:10:20	Yes	90	8:16:44	Yes
16	8:00:05	Yes	41	8:06:00	Yes	66	8:10:30	Yes	01	8:17:00	Yes
17	8:00:15	Yes	42	8:06:45	Yes	67	8:11:09	Yes	92	8:17:10	Yes
18	8:01:00	Yes	43	8:06:30	Yes	68	8:11:12	Yes	93	8:17:20	Yes
19	8:01:00	Yes	44	8:06:40	Yes	69	8:11:33	Yes	94	8:17:23	Yes
20	8:01:30	Yes	45	8:06:45	Yes	70	8:12:00	Yes	95	8:17:38	Yes
21	8:01:46	Yes	46	-	-	71	8:12:13	Yes	96	8:18:00	Yes
22	8:01:50	Yes	47	8:07:50	Yes	72	8:12:16	Yes	97	8:18:20	Yes
23	8:01:58	Yes	48	8:07:14	Yes	73	8:12:20	Yes	98	8:18:30	Yes
24	8:02:12	Yes	49	8:07:25	Yes	74	8:12:41	Yes	99	8:19:00	Yes
25	8:02:44	Yes	50	8:08:00	Yes	75	8:13:00	Yes	100	8:19:12	Yes

TABLE 2-12 (Con't)  
PASSENGER TRIP REQUEST  
ANALYSIS OF REQUESTS  
February 22, 1984

Call No.	Time	Scheduled	Call No.	Time	Scheduled	Call No.	Time	Scheduled	Call No.	Time	Scheduled
101	-	-	126	8:26:10	Yes	151	8:32:12	No	176	8:40:20	Yes
102	8:19:29	Yes	127	-	-	152	8:32:12	Yes	177	8:40:50	Yes
103	8:20:00	Yes	128	8:24:24	No	153	8:32:50	No	178	8:40:25	No
104	8:20:04	No	129	8:25:12	No	154	8:33:10	No	179	8:50:30	Yes
105	8:20:10	No	130	8:25:27	Yes	155	8:33:35	Yes	180	8:50:21	No
106	8:20:12	Yes	131	8:26:13	No	156	8:33:35	No	181	8:55:00	Yes
107	8:20:22	No	132	8:26:37	Yes	157	8:33:54	No	182	8:59:40	No
108	8:21:00	Yes	133	8:26:28	Yes	158	8:34:00	Yes	183	9:01:20	Yes
109	8:21:25	Yes	134	8:27:00	Yes	159	8:34:00	No	184	9:00:10	No
110	8:21:40	Yes	135	8:27:00	Yes	160	8:34:07	No	185	-	-
111	8:21:48	Yes	136	8:27:10	No	161	8:34:10	No	186	9:01:25	No
112	8:22:00	Yes	137	8:27:55	No	162	8:34:20	Yes	187	9:05:10	No
113	8:22:13	Yes	138	8:28:10	No	163	8:34:20	No	188	9:05:10	No
114	8:22:40	Yes	139	8:28:48	Yes	164	8:34:48	No	189	9:29:44	No
115	8:23:00	Yes	140	8:28:30	Yes	165	8:35:10	Yes	190	10:10:10	No
116	8:23:10	No	141	8:29:00	No	166	8:35:22	Yes	101	10:10:20	No
117	8:23:17	Yes	142	8:29:50	No	167	8:35:22	No	192	10:15:00	Yes
118	8:24:00	Yes	143	8:29:50	No	168	8:36:00	Yes	193	10:22:00	No
119	8:24:00	Yes	144	8:30:10	Yes	169	8:36:10	Yes	194	10:28:10	No
120	8:24:12	Yes	145	8:30:12	No	170	8:36:12	No	195	11:32:00	No
121	-	-	146	8:30:55	Yes	171	8:37:00	No	196	12:30:00	Yes
122	8:24:30	No	147	8:31:00	No	172	8:37:25	No	197	11:40:50	Yes
123	8:25:00	Yes	148	8:31:10	No	173	8:38:10	Yes	198	13:50:10	No
124	8:25:10	No	149	8:31:25	No	174	8:39:00	No	199	12:45:25	Yes
125	8:26:00	Yes	150	8:31:25	No	175	8:40:10	No	200	12:39:00	Yes
									201	13:52:00	No
									202	14:21:10	No
									203	14:55:00	No
									204	13:52:00	No

TABLE 2-13  
SCHEDULED TRIPS BY SEQUENCE AND TIME

<u>Call #'s</u>	1 - 25	26 - 50	51 - 75	76 - 100
<u>Time</u>	8:00-8:02	8:03-8:08	8:08-8:13	8:13-8:19
<u>Percent Scheduled</u>	100%	100%	100%	96%

<u>Call #'s</u>	101 - 125	126 - 150	151 - 175	176 - 204
<u>Time</u>	8:19-8:26	8:26-8:31	8:32-8:40	8:41-14:55
<u>Percent Scheduled</u>	74%	42%	36%	34%



SCHEDULERS  
COPY

CHICAGO TRANSIT AUTHORITY

SERVICE REPRESENTATIVES' SCHEDULES

WEEKLY SCHEDULE FEBRUARY 19, 1984 THRU FEBRUARY 25, 1984

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 JESSIE, VAUGHN	OFF	08:00	08:00	08:00	08:00	08:00	OFF
2 NORMA, FITZGERALD	08:00	1000	0800	0800	0800	OFF	OFF
3 ELLA, SUGOVIRLAND	OFF	OFF	1000	1000	08:00	08:00	0800
4 CARL, MC GHEE	SICK OFF	SICK OFF	SICK OFF	SICK OFF	SICK OFF	OFF	OFF
5 RUTH, KOCHER	0800	0800	0800	0800	0800	OFF	OFF
6 NED, JACKSON	0800	0800	0800	0800	0800	OFF	OFF
7 NANCY, CORALL	0800	0800	0800	0800	OFF	OFF	08:00
8 ZIGGY	0800	0800	08:00	08:00	OFF	OFF	0800

EXHIBIT 2-8

*Edward R. Reed*  
Edward R. Reed, Superintendent  
Special Services Washington Garage



## Run Schedule

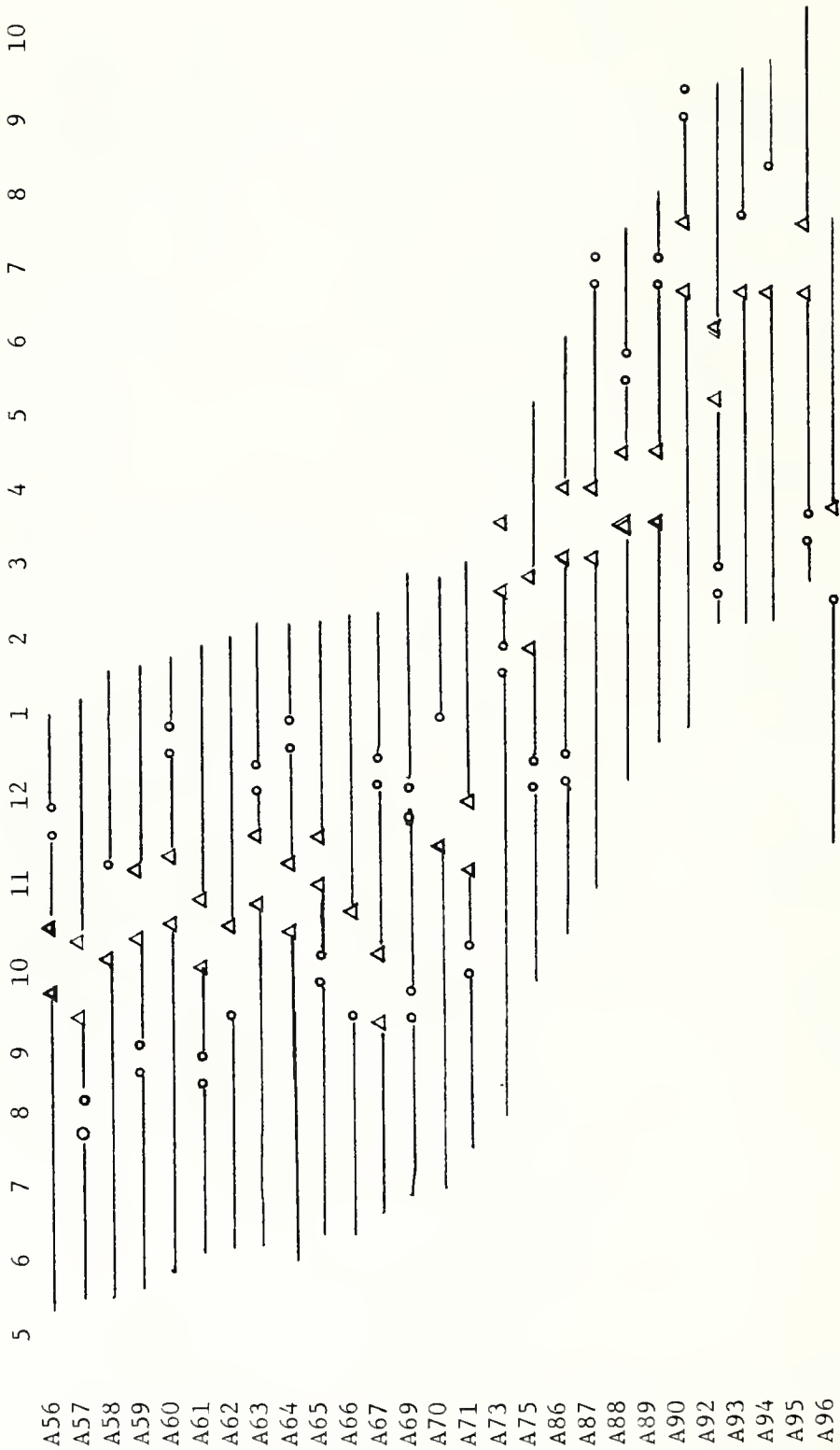
An examination was made to determine the compatibility of the run schedule with the needs of Special Services. There are 40 elements of service provided on a daily basis (Monday-Friday). The first operator reports at 5:10 a.m. and the last checks out at 10:05 p.m. Of the total runs, 12 (30 percent) are comprised of split shifts. This allows for greater flexibility in scheduling vehicles in peak demand periods and not to have vehicles standing idle in off-peak hours. There is another advantage from a scheduling standpoint. The split shift eliminates the need to interrupt a vehicle's schedule for an operator's lunch period. Even though the operator is not paid and the lunch hour is not scheduled, the attendant time prior to and after can be unproductive. This attendant time can be defined as the time necessary to deadhead to and from lunch breaks, or simply the time needed to "gear-up" after any break in routine.

Illustrated in Figure 2-2 is a list of runs indicating start and end time, operator lunch (40 minutes), and break (15 minutes) on the sample day selected. Split shifts have not been included unless a break was taken. The majority of the operator's breaks have been scheduled between the hours of 10:00 a.m. and 12:00 p.m. There is very little service available during this period. The question is whether the lunches are taken at this time since there is no demand, or is no service available due to the fact that the majority of the operators are on lunch or break? In some instances, lunches and breaks are taken concurrently which means a vehicle is out of service for 55 continuous minutes. On several occasions, a break was scheduled, a period of inactivity for 15-20 minutes, then the lunch break. This type of scheduling can be devastating to service availability since that renders a vehicle inactive for one hour and 15 minutes, or even longer.

While it is recognized that work rules and labor regulations stipulate that lunches must be given within certain parameters, it is inefficient and counter-productive to attempt to preschedule lunches rather than to schedule them for periods of low demand. A forty minute lunch and 15 minute break also appears to exceed industry standard -- as well



FIGURE 2-2  
RUN SCHEDULE INCLUDING LUNCHEAS AND BREAKS  
FEBRUARY 23, 1984



Δ Δ LUNCH  
o o BREAK  
Δ o LUNCH-BREAK

as CTA's labor agreements. The industry norm is a thirty minute lunch and ten minute break. With a 40-minute lunch, CTA is paying each operator for 10 minutes of lunch break, which is not in their labor agreement. Additionally, the provision of a 15-minute break is not dictated by any labor agreement or written CTA policy. To have the operator's downtime scheduled raises the issue of what does the operator do when a call is cancelled? The high frequency of no-shows and cancellations examined earlier would appear to afford more than ample opportunity to schedule lunch and breaks at those times on the day of service.

## COMMUNICATIONS

### Radio System

Each vehicle is equipped with a two-way radio, and a base station is installed in the dispatch office to facilitate communications between operators and dispatch. The responsibility for maintaining communication with the vehicle operators rests not with the schedulers, but with the dispatchers. The dispatchers are also the assistant superintendents.

Special Services does not have a dedicated frequency and must share air time on the CTA supervisor frequency. This can become a critical factor during CTA's peak times on fixed-route operations. For this reason, Special Service operators do not radio in each stop but limit their communications to the following:

- 10-8 (ready for service);
- radio check;
- no-shows;
- cancellations;
- emergency situations; and
- accidents.

It is the unusual occurrences and not the normal operation activities that necessitate communication between dispatch and the operators.

### Telephone System

Special Services is equipped with a telephone system that allows the storage of 26 calls before a customer receives a busy signal. In peak periods, up to eight schedulers will accept requests for service. The



system is so equipped that the phones will not ring in the scheduling office until exactly 8:00 a.m.

Each work station is equipped with a standard phone with four (4) lines and a hold button. The public has one basic number to call for service and another number for dispatch on the day transportation is scheduled.

### Summary

If enthusiasm, dedication, and commitment were the only criteria, the Special Services Project would be an overwhelming success. But if efficiency and effectiveness must be considered, there is considerable room for improvement. There is a general feeling from staff that the solutions to these problems require more -- more vehicles, more personnel. It is felt that more efficiency and more effectiveness could actually be achieved with current levels of equipment and personnel, or even less.

In comparison with similar systems, Special Services exceeds in some areas and falls short in others. In terms of productivity, Special Services is slightly below average, achieving less than two passengers per vehicle hour. System reliability, as shown by wait time data, is less than acceptable while ride times are reasonable given the nature and type of service. The adjusted cancellation rate of five percent is normal, however, the volume of trip adjustments is felt to be negatively affecting the schedulers' efficiency. Whether or not the current capabilities of the computer are actually an aid or hindrance to scheduling is debatable and will be addressed more fully in a later task. The greatest benefit of the computer is the quantity of data that can be generated. Unfortunately, much of this data is questionable since there appears to be little consistency in the reporting of operational statistics.

It is felt that the efficiency and effectiveness of the system are constrained more by policies and procedures than by actual operational capabilities. If there is one area that can be labeled inefficient, it is in the order taking and scheduling process. These procedures are extremely labor intensive, cumbersome, inefficient, and more than likely,



are the single most limiting factor in increasing productivity. There are approximately 175-200 trips scheduled per day. This is accomplished by eight schedulers. In many systems, this volume of trips would be scheduled by no more than two schedulers -- and in some systems by one.

These procedures must also be viewed very negatively from the public as evidenced by the fact that riders seldom to call in for a ride after 9:00 a.m.

In our section on recommendations, the emphasis will be placed on how to increase efficiency and effectiveness through improvements in the order taking and scheduling process. The success that the system enjoys now is contingent upon the abilities of several key individuals. We will suggest modifications of procedures so that the scheduling process is based upon a standard set of procedures that can be performed equally by all members of the dispatch staff.



## SUBSECTION 2.1.2

### OPERATING RECOMMENDATIONS

The recommendations presented in this section are the result of the findings presented in Technical Memo 1, dated May 1984. That memo concerned the operating analysis of the Special Services Program. And addressed such issues as productivity, wait and travel times, and, most importantly, the scheduling process.

In attempting to make recommendations that will improve the service, consideration must be given to any changes that may be made as a result of CTA policy decisions. For example, if CTA were to change the reservation policy, or open the service to a broader segment of the community, this would have an effect on what recommendations were to be made. Therefore, we considered recommendations that will be viable enhancements to the system regardless of what service changes are implemented. It is our opinion, though, that the current system could not be made available to meet any more of the unmet demand with the current resources and procedures. Implementation of the recommended suggestions will, however, result in a 5-10 percent increase in efficiency and productivity.

The recommendations presented in this section will focus on such areas as:

- \* Data Collection and Standardization
- \* Scheduling
- \* Dispatching
- \* Staffing
- \* Equipment
- \* Run Schedules

The recommendations made in this section can almost be considered simplistic. They are nothing more than a return to the procedures and policies that may have existed at the start of the program. Over the years, these procedures have been modified and relaxed to conform to the pressures brought to bear upon management and staff for a variety of reasons. For example, the extended operator lunch and meal breaks, the





change from dynamic scheduling to the present system, and the inconsistencies in the collection and reporting of data.

The major shortcoming of the Special Services Program concerns the scheduling procedures. They have departed from the original concept and requirements of the computed assisted program. The result is the current procedures that require a staff of twice the required size, and a productivity of less than half of what should be achieved.

In order to measure the success, and properly evaluate the program, not only against other comparable systems, but against itself as well, data collection and the standardization of that data must be accomplished.

There is absolutely no reason that Special Services cannot reduce costs and increase productivity (within reasonable expectations), with the proper decisions by management to eliminate the constraints that the system has placed upon itself. The ability to become more efficient and cost effective is well within the capability of the system design and those who manage it.

#### DATA COLLECTION

As previously mentioned in the operating analysis, the computer systems biggest contribution is the storage and instant retrieval of data. It is questionable whether the computer is an actual asset in the scheduling of trips. The determination of the "best trip" is strictly independent of the computer system and made by the scheduler. The schedulers make their decision on which run to schedule a trip based upon their knowledge of the service area, their familiarity of the run schedule, and the existing list of subscription passengers.

In addition to providing the scheduler with the current status of the number of trips scheduled on a particular run, the computer system has the ability to provide management with a wide array of statistical data. From this data, productivity can be calculated, wait and ride times determined, frequency of no shows and cancellations can be calculated, trip type, number of lift users, and many other important statistics can be generated.



What we discovered in our analysis is that almost all the data being generated is somewhat "tainted" in the respect that the data is not kept consistently, nor does the manner in which data is calculated generally conform to measures that are standard in the industry. Statistics and operating data kept in such a manner renders the information derived virtually meaningless.

The following recommendations are made to standardize the data and allow the performance of Special Services to be evaluated against similar systems on an "apple-by-apple" comparison basis.

### Productivity

In paratransit operations such as dial-a-ride and Special Services, productivity is one of the key indicators of performance. It is the number of passengers that a vehicle carries in a vehicle "service hour". A vehicle service hour is usually defined as the time that a vehicle is in-service and available to pick up passengers, less any time for lunches or operator breaks. This in-service time is calculated from the time the vehicle leaves the garage until the time it returns. Special Services calculates their in-service hours as the time from the first pickup until the last dropoff but does not deduct for operator lunches or breaks. Special Services calculation includes no deadhead travel time to the first pickup or from the last drop-off back to the garage. Although this almost results in a tradeoff, it was determined that the actual result was an overcalculation in productivity by Special Services. According to the data generated by Special Services the productivity rate is overstated by approximately ten percent.

It is recommended that the following modifications be made in the method of determining productivity:

- Calculate in-service time from the time the vehicle leaves the garage until the time the vehicle returns to the garage.
- Deduct operator lunches, breaks, and any vehicle breakdown from the calculation listed above.



### On-Time Performance

From a user standpoint, on time performance is perhaps the most critical performance measure. Did the vehicle arrive as promised? Was the travel time reasonable, and was the passenger delivered to their destination on time? In Special Services, trips are booked not by what time the passenger requests to be picked up, but by what time the passenger wished to be at their destination. As found in our analysis, the percentage of time that a passenger is picked up within plus or minus ten minutes, from their promised pickup time is approximately thirty-three percent. While it may be possible that the time requested simply is not available, the instances of on time performance need considerable improvement. This survey was based upon those trips that are placed on a daily basis. According to the data surveyed it was found that overall Special Services on time performance for both subscription and daily requests is approximately 73.7 percent. Wait time is defined as the elapsed time between when a customer is scheduled to be picked up and the time they are actually picked up. The definition of acceptable on time performance in the industry is that a customer should be picked up no more than 10 minutes early, nor more than 5 minutes late. This goal should be able to be achieved ninety percent of the time. As with other performance standards, Special Services indicators are somewhat broader. Special Services considers a pickup to be on time if it is made no more than 10 minutes early, nor more than 10 minutes late. This goal is twenty five percent broader than industry standards and yet is still eleven percent below standard. It is felt that even this ratio is overstated due to the manner in which records are reported and maintained. As noted in an earlier section, far too many pickups are reported as made exactly when scheduled. When every single passenger is picked up and delivered at the precise time scheduled, for an entire day's run, the data must be questioned.

There are several factors contributing to the questionable accuracy of the data: operators do not consistently maintain the same procedures; and schedulers appear to enter the promised time, if no time is indicated, when trip history posting is accomplished.



The following corrective action is recommended:

- Redefine on time performance as no more than 10 minutes early, nor more than 5 minutes late.
- Standardize the time that operators report pickups. It is recommended that operators report the time they arrive as the pickup time, as opposed to some reporting the time the passenger boarded, or the time they left the stop.
- If the pickup time has been omitted by the operator, when trip history posting is being made the pickup time should be left blank. This trip would not then be included in the analysis.
- When scheduling multiple pickups at the same address the same pickup time should be used. Past practice has been to schedule the first passenger at 9:15, the next at 9:16, then 9:17, 9:18, etc. The operator would dutifully report the pickups made at 9:15, 9:16 and so on.
- The same recommendations apply to travel and delivery time. Operators should report the time they arrive at the delivery. Not the time the passenger left the vehicle, or the time the vehicle left. Multiple deliveries at the same address should also be reported as one time.

### Cancellations

The analysis of no shows and cancellation initially revealed what was determined as a high ratio of cancellations to number of passengers carried. This percentage amounted anywhere from twenty to thirty percent on a given day. Upon further investigation it was discovered that Special Services is including far too many adjustments in service as a cancellation of one type or another. A cancellation is normally considered to be an individual who has booked a ride, but cancels on the day of service. A no show is an individual who has scheduled a ride, but fails to appear when the vehicle arrives.

Included in Special Services definition of a cancellation are the following:



- A subscription (99) passenger who has an indefinite cancellation.
- A cancellation made by Special Services and not the passenger.
- A cancellation made the previous day.
- A permanent cancellation by a subscription passenger.
- A general adjustment which includes cancellation of a trip due to an incorrect address. (A trip which is consequently re-scheduled.)

After the elimination of these other cancellations that should not be considered cancellations at all, the ratio of cancellations was determined to be only 5 percent. This level can be considered acceptable and confirms to industry standard.

While it is beneficial to record these other types of cancellations they should no be included in the cancellation rate for the days ridership. Only those passengers cancelling on the day of service should be considered a cancellation. This type is identified as code C.

#### Additional Recordkeeping

It is recommended that two other elements of data be maintained. The first is the ratio of subscription trips and those trips scheduled on a daily basis. The goal of Special Services is to maintain a 50-50 balance.

This data was calculated by hand for one day and the ratio was forty percent subscription and sixty percent call in. It is not know if this is typical. This analysis can be easily obtained by programming the computer to generate this information. This information will be useful to determine if the subscription passengers are abusing their status by frequent canellations, which in turn denies those on the waiting list. It will also permit analysis of the effectiveness of the scheduling staff to accommodate a greater number of call in passengers.

The second element of data that is recommended is to compile the number of trips booked by each scheduler. It was noted that this information is sometimes calculated by hand by the Assistant Superintendent. This data is available in the computer program according to the Documentation





Manual and is listed under Office Efficiency Report. It is available on a weekly basis and reports the number of trips scheduled by each scheduler.

## SCHEDULING PROCEDURES

### Subscription/Standing-Order Trips

Special Services recognizes two classes of trip request: Subscription or "99" trips and single-time non-subscription "0" trips. Non-subscription request practices are discussed below.

Once an individual is given the privilege of a subscription trip, that trip will be provided at least 3 days per week as specified by the client. The scheduling of "99" trips, since they are standing commitments, constitute the initial "skeleton" tours to be filled in with single-time trips on the day prior to service. The construction of these skeleton tours of 99 trips must fit the various commitments into efficient vehicle tours, and they must be periodically reviewed and modified as existing 99's are terminated or placed on temporary suspension and new 99's accepted.

Presently, the 99 skeleton tours are reviewed by the scheduling staff with the assistance of the vehicle operators every 3 months to attempt to identify more efficient starter tours. Possible problems with the tour scheduling are also identified through the Trip History Posting function of the Special Services computer, which shows which pickups and drop-offs are not being made at the promised times. Because of the low turnover of 99's, the Special Service subscription clientele and their travel patterns are very stable, and, at the typical 3 month review, only from 6 to 12 changes are normally made to the skeleton "99" tours.

In conjunction with recommendations elsewhere in this report to increase the turnover of subscription (99) privileges, we would recommend that on-time performance and changes to 99 trips be closely watched. Should a higher turnover of 99's be achieved, we would recommend that the subscription starter tours be thoroughly assessed at least monthly to ensure the most efficient tours. As an observation, the ability to efficiently serve subscription trips is so important that most paratransit systems grant subscription trips not on the basis of a waiting





list, but according to whether the desired trip can be efficiently served in conjunction with prior trip commitments.

#### Non-Subscription Trips

As described in the analysis, the scheduling of non-subscription trips is accomplished by customers calling in and requesting service. Ninety percent of all calls are received during the first hour beginning at 8:00 a.m. The remainder of the day is then devoted to the booking of those requests. And, finally, between 3:00 p.m. and 4:00 p.m., the customer is notified, or calls in to confirm that their request has been accepted. There are several deficiencies inherent in this system. It requires a full staff of eight individuals to accommodate these incoming calls at the beginning of the day, but the number of trips that are booked cannot justify that level of manpower throughout the day.

It is also apparent that service is available only to those fortunate enough to get through during the first hour. This combination of events results in an inefficient system from the standpoint of the large number of individuals required to accept and process service to what can only be considered relatively few passengers.

Current procedures result in duplication of effort necessary to schedule a ride. By not scheduling the trip at the time the customer calls results in a process that contributes to the inefficiency of the scheduling process. The scheduler must take down the information on a passenger trip request and the same information is again handled later in the day, a process that could be eliminated if dynamic scheduling were to be accomplished. These procedures also require that the customer call in twice, once to request the ride, and again to verify that the ride was booked. It is often the case that a passenger will not know until 4:00 p.m. that they cannot make a medical appointment that may have been scheduled from the previous day. This unnecessary duplication of work prevents the system from functioning in a more productive manner. Instead of exerting time doing the same task twice, this effort could be used performing additional tasks.



There is no technical reason that the scheduling cannot be accomplished at the time the customers call in. This ability is limited only by the training, and competence of the scheduling staff. It is the opinion that the current procedures were developed as a means to accommodate the abilities of the staff. It is felt that several of the schedulers possess the capability to schedule dynamically. But the system does not currently possess sufficient skilled personnel to achieve this method of scheduling.

There are several possible recommendations to improve the productivity of the control room staff. We do not feel that it is possible to immediately change from the current procedures to dynamic scheduling. We do, however, feel that this should be the goal of Special Services. This goal could be achieved in incremental steps.

The most notable deficiency in the control room is the inordinate number of staff needed to schedule a relatively few non-subscription rides on a daily basis. Since the capacity for ridership cannot be increased to justify the level of scheduling, it is recommended that the number of schedulers be reduced to a more efficient level. The only justification for the large staff is to accommodate the influx of telephone calls in the first hour of the morning. The number of trips that are subsequently booked do not justify those numbers.

The present reservation system can be maintained by drawing manpower to accept incoming calls from other resources of the Washington Street Garage. These resources can be the garage clerks, extra board drivers, maintenance/janitorial personnel, Assistant Superintendents, etc., or perhaps even volunteers from the Elderly and Handicapped community that the system is serving. As mentioned in the analysis, the taking of phone requests is simply a mechanical function that anyone can accomplish after 15 minutes of orientation. Since approximately ninety percent of all requests are received during the first hour, this additional manpower is needed for only a short period of time.

The advantage of this recommendation is that it will allow a reduction in the number of staff required to take phone requests. The reduced



staff can therefore become more efficient in the booking of trips. It does not however, eliminate the mad rush by the public to secure a ride. It is though, the first step in making the scheduling staff more efficient.

The next step in preparing to schedule dynamically is to eliminate the mass calling in the morning and to more evenly distribute calls throughout the entire day. Since the public has been accustomed to the "first come, first served" method of obtaining service it may be difficult to acclimate them to the fact that they can call later in the day and be able to obtain a ride. It is impossible to schedule trips while the customer is on the phone under the present procedures. Therefore, the calls must come in at a slower pace to allow for dynamic scheduling.

This distribution can be accomplished in either of two methods. Both by restricting the times that calls will be accepted. This can be coordinated to coincide with either the present zone system or on a geographical basis. For example, calls can be accepted as follows:

ZONE	TIME
1, 2, & 3	8:00 a.m. - 10:00 a.m.
4, 5, & 6	10:00 a.m. - 12:00 a.m.
7 & all	12:00 p.m. - 2:30 p.m.

The second method is to accept calls by geographical boundary. For example, those wishing to travel within the area currently designated as North would call between 8:00 a.m. and 10:00 p.m. Those passengers travelling in the area defined as South would call between the hours of 10:00 a.m. and 12:00 noon. The time period from noon until approximately 2:30 would be designated for inter-area trips as well as the overflow from the other two areas. Since a certain number of vehicles are already preassigned to areas designated as North and South, there should be no concern that the first areas calling would dominate the service. The proper determination of zones or areas could best be decided by Special Services staff based upon past demand and travel patterns.



The primary advantage of this procedure is that it allows for the elimination of the temporary assistance needed to answer the telephones in the earlier recommendation. Phone requests will be received in a more orderly, less frenzied manner. It will allow for much, if not all of the scheduling to be completed on a dynamic basis. As previously stated, there appears to be no valid reason why trips cannot be scheduled at the time the customer places the call. The only restrictions are those that Special Services places upon itself in the form of policies and procedures.

The final phase of this recommendation process is to remove the restrictions placed upon the public in terms of when they can call in. This will be accomplished when the public gains the confidence in the system that they can receive service without having to call in the first hour of the day. It will also allow the schedulers to gain confidence in their ability to schedule trips while the customers are on the phone.

Specific recommendations on the skill requirements to prepare the schedulers for this eventuality appear under the recommendation for the staffing of Special Services.

#### "Fast Link" Service

The CTA Service Planning section designed the "Fast Link" service as a strategy for reducing vehicle mileage, deadheading, and increasing productivity. The Fast Link service strategy involves pick up of ambulatory passengers in areas by several vehicles, then transfer of these passengers to a single vehicle for the long trip to downtown Chicago and delivery to their destinations.

Fast Link services were reportedly attempted from several areas, resulting in a number of complaints which in turn reduced the commitment to this strategy. At the present time, two Fast Link runs operates into the Loop area from the north of the city and one from the south.

The key to the success of the Fast Link concept lies in the closeness of a number of trip origins and times and the ability of Special Service passengers to effect a transfer from one vehicle to another.



The Fast Link should not require more than one transfer and should not require a transfer by individuals in wheelchairs. The transfer of a wheelchair from one vehicle into another is quite time-consuming and may eliminate any time savings when the other Fast Link passengers are considered. Individuals in wheelchairs are not eliminated from the Fast Link service, but must be scheduled for pickup by the Fast Link vehicle rather than a feeder bus.

A positive transfer requires only 2 to 4 minutes for each vehicle involved. The Fast Link transfer needs to take place at least that far (in travel time) outside downtown Chicago and, as a second condition, the transferring vehicles need to be headed for additional pickups in other than the Fast Link direction. Given these minimal conditions, analysis of established travel patterns in the Special Services program will identify the needed trip densities to support a Fast Link, and then scheduling staff should begin negotiating time adjustments for 99's and single-time trips into the Fast Link parameters.

The Fast Link service can effectively evolve into a feeder/shuttle service and, in places, be replaced by accessible rail service when that becomes available. To enhance the Fast Link option and its flexibility, transfer locations should be identified at either CTS bus or rail stations or, even more attractive, at regional shopping facilities. Particularly where the transfer must be made at a shopping facility, the wait for a transfer may become an opportunity rather than a burden.

We would strongly recommend that the Fast Link concept be used as a strategy for reducing deadhead travel and low productivity, downtown-oriented trips. Fast Link trips should be planned at high travel times and trips negotiated to feed into the Fast Link shuttle. The Fast Link service could become especially important to Special Services if a decision is made to expand eligibility for the program. An expansion of eligibility would significantly increase the number of ambulatory handicapped using the service, almost all of whom could transfer to a Fast Link bus.





## DISPATCH

Although the dispatching function is performed by the Assistant - Superintendents, independent of the scheduling function, there appears to be no adverse effects as a result of this relationship. The next day's schedule is prepared by the control staff and turned over to dispatch. The public is also aware that if they call about their trip on the day scheduled, they call directly to dispatch, and not to the schedulers. The only area where closer coordination could be desirable is when a scheduled passenger cancels and the dispatcher attempts to fill that vacancy from the lists of passengers whose requests for service could not be honored. It would appear that the schedulers would be in a position to better know when and where to fill that vacancy.

It is not the suggestion that the control staff be brought into this loop, but to provide dispatch with additional information when a cancellation or no show occurs. Current procedures when an opening exists is for the dispatchers to review the stack of requests from passengers unable to be served. Since a decision must be made quickly, and the dispatchers must search through a pile of requests, it is felt that there are missed opportunities due to a lack of a formalized procedure. This could be solved by one of several methods: (1) have the scheduling staff generate a computerized list of those unable to be scheduled. If the computer will not facilitate this list a dummy run could be created and the customers could be listed, in chronological order. The following information could be provided:

- \* time requested
- \* origin and destination
- \* customer name
- \* zone
- \* phone number

The dispatcher would then have on one sheet of paper all the requests that were unable to be filled. When a vacancy occurs, the dispatcher can scan the list in order of time for possible insertions.

If this list can not be generated with the assistance of the computer, then it is recommended that the requests be placed in a three ring





binder. They can be either placed in chronological order, or by zones. When an opening occurs the dispatcher will have a quicker method to determine the feasibility of an insertion than currently exists.

It was recommended that operator breaks be scheduled as opportunities exist, and not at preset times. In order for this to occur the dispatcher will have a more active role in the scheduling of trips. This will also depend on a more reliable radio communications frequency.

#### STAFFING

It is apparent that the number of scheduling staff required to book approximately 175 requests a day is excessive. In a typical eight hour day this translates to approximately 22 customers scheduled per hour. Since there are six schedulers assigned to the scheduling task this means that approximately 3.7 requests are scheduled per hour per scheduler. While we realize that schedulers have other duties, it indicates the inefficiency of the scheduling staff. There are demand-responsive systems that schedule as many rides with one scheduler. It is felt that of the contributing factors that so many people are required is a result of the current operating policies. Current policy is that calls will be accepted on a first come, first serve basis. This results in the mass telephoning in the first hour of the day. It is this influx of calls that gives the staff the belief that they are understaffed and that they need additional support to handle the demand. We believe that the procedures and concessions made to accommodate the skill level of the schedulers that have developed over the years are responsible for the current inefficiencies. While it is true that the incoming telephone calls demand a staff of eight people, the scheduling of those calls can hardly justify that level of manpower to book those trips.

As outlined in the recommendations on the scheduling procedures it is felt that the current level of work can be accomplished by no more than four schedulers. Assuming a demand of approximately 200 calls per day, this would result in an average of 6.25 customers scheduled per hour. Although this represents an increase of approximately one hundred percent, it is nevertheless still below the capability that can be achieved. At a



minimum, schedulers should be able to book at least 10 callers per hour, (resulting in 20 one-way trips) or one every six minutes.

The key to the success of the Special Services program is based upon the proper utilization of the computer system, and the personnel to adequately, and competently, utilize its capabilities. To quote from the System Description: "The Demand/Response Transit System was developed to meet personal transit needs of the Elderly and Handicapped. Basic to the system are a highly skilled group of people who can process telephone requests for transit services and schedule passenger pickup and delivery efficiently to utilize the bus capacity and assure reliability of the schedule."

While Special Services has several skilled individuals, the system suffers from the lack of a "highly skilled group" of people which is imperative for a successful program.

In order to utilize and maintain a productive control staff, it is recommended that the staff be reduced to the suggested size of four dedicated schedulers. The manpower to do trip history posting, and other duties, are not included in this staff of four. The remaining staff and subsequent replacements should be given the following intensified training:

- area familiarization, including time spent riding on the vehicles;
- total familiarization with the run schedule;
- improved telephone techniques; and
- total familiarization with current subscription lists and run schedule.

#### EQUIPMENT

Although the control room is of sufficient size to accommodate the needs of Special Services, there are several improvements that can be made. These improvements are both aesthetic and practical. From a purely cosmetic point of view the present room is devoid of any indication of the purpose of the work being performed. It is recommended that graphs and posters indicating such performance indicators as ridership or record number of calls taken be displayed to act as both a motivational and information tool. It would also be beneficial, from both a



cosmetic and useful standpoint, to have one or more large maps of the service area, complete with zones, mounted on the wall to assist the schedulers to visualize the trips that they are scheduling.

There are several modifications that can be made to the telephone system. The schedulers currently answer the phone by hand which makes it difficult to access the CRT, or to write down any information while using one hand to hold a telephone. It is recommended that a "hands free" system be installed. This use of a headset will allow the schedulers the use of both hands while performing their duties. If the telephone is not equipped for a star set, an adapter can be purchased that will plug into the jack in the phone. These items are inexpensive and can be purchased from several sources.

It is also recommended that the number of incoming lines be reduced. The system currently allows for 26 lines to be accessed before a caller reaches a busy signal. It is felt that this results in an unusually high number of individuals that are placed on hold. If the recommendations presented in this section are implemented the need for this many lines will be eliminated. There will not be the level of staff to answer this many lines, nor, with the new procedures, will there be the current influx of calls concentrated in one period of time.

Since communications is the key between the operators and dispatch, it is highly recommended that Special Services be placed on their own frequency. Due to the fact that Special Services shares the frequency with the supervisors on CTA's fixed route operations, communications between dispatch and the operators is kept to a minimum. This makes it difficult at times to contact an operator with a cancellation, additional pickup, or making a change in the operators schedule. [Note: This action was taken during the final phases of this study.]

It was recommended that operators not be prescheduled for breaks. Operator breaks would be taken during periods of low demand, or cancellations in the schedule. In order for this policy to be implemented a clear, reliable, dedicated frequency is a prerequisite. Dispatch must



have the ability to communicate with the vehicles at all times in order to have a safe, reliable, efficient system.

#### RUN SCHEDULES

In terms of vehicles, operators, extra board, split shifts, and distribution throughout the day, the basic run schedule appears to be more than adequate. The schedule provides a sufficient number of vehicles during peak hours when demand is greatest. We have identified concerns, however, with regard to the scheduling of operator lunches and breaks and relief practices.

#### Operator Lunches and Breaks

There is some question of whether trip requests are dictating the scheduling of driver breaks and lunches or whether there is perhaps a little too much consideration given to the operators' schedule, at least in terms of priorities. It is felt that the needs of both the clients and operators could be better accommodated with some modification.

The two areas of concern are the schedules of operator breaks and lunches. It is recognized that there are governing regulations, both internal (work rules) and external (federal and state) that affect the schedules of lunch and break periods. The scheduler must schedule the operator's lunch within a 5 and one-half hour period from the operator's start of shift, and, basically, this is accomplished very well. We do, however, question the duration of the lunch -- forty minutes. This is neither a law nor part of the labor agreement, and exceeds the 30 minute lunch specified in the CTA operator agreement. Of the 40 runs, 28 straight runs have a scheduled lunch. The additional 10 minutes amounts to 280 minutes or approximately 4 and one-half hours of lost in-service vehicle time on a typical weekday. At the current productivity rate of 1.8, an additional 8 passengers could be provided service each day.

In addition to lunch, Special Services operators also receive 1 fifteen minute break. The scheduler may insert this break period anywhere in the operator shifts. As with the lunch period, the duration appears



to exceed industry standards: breaks normally average ten minutes. If we add the additional 5 minutes to each of the 28 runs, the loss in productive time is now 420 minutes or approximately 7 hours per day. The potential additional passengers now becomes thirteen. This represents an increase in the average daily ridership by approximately 3 percent.

Besides being somewhat longer than mandated or generally accepted, the prescheduling of operator lunches and breaks is felt to constrain the schedulers' productivity. By predetermining lunch and break times, scheduling flexibility is greatly reduced because the bus must be scheduled to be empty at these times.

A review of several days' Final Trip Sheets reveals that on each run there is invariably at least one cancellation, no show, or service adjustment in excess of ten minutes. We would recommend that this time be used for driver breaks and that they not be prescheduled. The potential increase in productive in-service vehicle hours by the elimination of the prescheduled break and the decrease in lunch by ten minutes will produce approximately 12 additional hours of service and potentially serve 23 more trips per day -- an increase in ridership by five percent without increasing costs.

### Relief Practices

Our second concern with operator scheduling is whether added productivity could be achieved with the use of on-street reliefs, as the run schedule was originally designed. Currently, all Special Services operators begin and end their work runs at the Washington Garage and, in practice, all "relief" drivers take out a new vehicle even though they may not be allowed pull out time for the preoperations check of a new vehicle.

The Special Services program run schedule is designed for on-street reliefs, in which a new driver would take over an in-service vehicle at a specified transfer point in the service area. This on-street relief allows the vehicle to be used in continuous service, so that it need not





be empty nor deadhead to and from the garage. Additionally, the continued use of a vehicle through the day rather than each driver using a new vehicle reduces maintenance and servicing costs since fewer vehicles will have been in-service on any given day. Our analysis found that scheduled on-street reliefs are taking place in the Washington Garage.

It is likely that some reliefs will conveniently occur at the Washington Garage. These should not be avoided, however, reliefs should occur so as to maximize the efficiency and productivity of the system.

### Recommendations

The recommendations with regard to the run schedule are summarized as follows:

#### Recommendations

- Reduce operator lunches from 40 minutes to 30 minutes.
- Eliminate prescheduled operator break and issue breaks during low demand or cancellation periods.
- Return to on-street reliefs.

#### Advantages

- Bring Special Services in line with CTA agreements and industry standards with regard to time of lunches and breaks.
- Increase in-service hours by approximately 7 per day.
- Increase ridership by approximately 23 more trips per day.
- Increase ridership by approximately 5 percent with no increase in cost.
- Reduce deadhead travel.
- Reduce vehicle servicing costs.





## SUBSECTION 2.2

### POLICY ANALYSIS

Special Services provides its transportation within very narrow guidelines specifying such aspects as eligibility, request procedures, and promptness of clients. Most of the current policies were formally established when the system was implemented almost three years ago; others have come into existence through the procedures and practices of day-to-day operations.

Policies and related procedures are generally created to have a desired positive effect on the provision of transportation service. However, they may also have unintended side-effects, which may not be desirable. Additionally, policies and procedures may have unintended impacts because of the way they are implemented and carried out on a day-to-day basis.

The purpose of this section is to analyze the major policies and procedures which guide the operation of the Special Services system and to identify or estimate their impacts (good and bad) on operations. Several major policies and/or procedures have been addressed earlier within the Analysis of Scheduling/Dispatch Procedures and will not be dealt with again here; these include: subscription and reservation request procedures and on-time performance.

#### WAIT TIME POLICY

##### Description of Policy

Under present special service policy, users are asked to be prepared at least 10 minutes before the scheduled bus arrival time. When the bus arrives, the driver must wait 5 minutes for the passenger to appear for the first (outgoing) trip and 10 minutes on the return trip. During or at the end of this waiting period, the driver may ask the dispatcher to telephone the passenger to inform them the bus has arrived. Additionally, the driver must wait an additional 5 minutes if the passenger is contacted by phone or otherwise indicates they are on their way to the bus. If the passenger fails to appear and cannot be contacted by phone by the end of the "grace period," they are marked as a "no-show" and the bus



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continues to its next stop. (See separate discussion of CTA "no-show" policy.) Clients who are repeatedly late in appearing are personally called by the Special Services Superintendent who attempts to determine if there is any particular reason for such lateness and discusses the importance of being on time.

The CTA Advisory Committee on Services for the Disabled has approved a revision of the definition of "lateness" and CTA's wait time policy to eliminate the automatic 5 and 10 minute grace periods following the vehicle arrival. According to the suggested policy, the passenger would be considered late if the bus is on time and the passenger is not ready at the prearranged scheduled pickup time. The operator would call the dispatcher if the passenger is late, and the dispatcher would attempt to phone the rider to determine if they would be ready within 5 minutes. If the passenger will be ready in 5 minutes, the operator is instructed to wait; if the passenger is not boarding in 5 minutes, the operator may be instructed to depart.

#### Impact on Operations

Carried to its extreme, the existing wait time policy would require a nonproductive wait time of 10 minutes on each segment of a passenger's two-way trip, or up to a total of 20 minutes per round-trip passenger. At a productivity of 1.8 trips per vehicle service hour, the present policy has a potential loss of about 18 minutes of productive time during each vehicle service hour -- considering that Special Services operates about 265 total vehicle hours of service each weekday, the total potential lost time each weekday due to this policy is about 79.5 vehicle service hours.

The actual time spent waiting for passengers varies substantially, although no operating data is recorded on which to base an analysis of wait time. The majority of Special Service users are conscientious and attempt to be prepared for their vehicle's promised arrival. Unfortunately, a minority of system users -- either new, infrequent, or regular riders -- are not waiting when the vehicle arrives.

The impacts of this wait time policy in system operations are significant. First, the actual lost productive time due to excessive waits



for the passenger to appear and board may be reducing overall system productivity equivalent by up to about 23 percent of its normal capacity -- in other words, if all passengers were on-time, that much more service could be provided. The second impact of the policy is that scheduling procedures must allow for regularly long wait times at pickups, requiring a very "loose" schedule and severely limiting the efficiency which can be achieved in the system. The scheduler must ensure that sufficient time is allowed for these long wait times without totally disrupting all promised pickup times of later trips.

The third significant impact of the wait time policy is on the system's passengers themselves. Although the wait time policy was developed in order to be fair to the handicapped passenger, it ends up unfairly impacting one's fellow passengers who must wait 5 or 10 minutes for a passenger to appear and impacting Special Service's clients in general since the policy reduces the amount of services which can be provided.

The revised wait time policy in conjunction with penalties for no-shows and late cancellations should noticeably decrease delays for passenger appearance and increase system productivity. The effects, however, assume that scheduling procedures will reduce the "slack" now left for these long passenger waits and that the new policies will be strictly and fairly enforced.

#### NO-SHOW POLICY

##### Description of Policy

Since late 1983, CTA's policies for "no-shows," late passengers, and cancellations have been under review by CTA staff and CTA's Advisory Committee on Services for the Disabled. This review was prompted both by the legal opinion that suspension of Special Service privileges for repeat offenders could constitute a denial of service without due process and also by the increasing problem created by tardiness.

Prior to the current proposed changes, a Special Services rider who compiled 3 no-shows within a 30-day period would be suspended from the program for 30 days, at which time they would be reinstated. This policy



was invoked with several clients, whose service privileges were suspended for the specified 30 days. Due to staff knowledge of regular clients, it appears that the no-show policy was most likely equally applied, even though no regular records are kept of individual client performance and service usage.

The policy change approved by the Advisory Committee would levy a progressive surcharge on the no-show passenger, making it increasingly more costly to no-show during a 30-day period: \$1.00 surcharge for first no-show, \$2.00 for second, and \$5.00 for third no-show and all others within a 30-day period. All passengers start each 30-day period with a clean slate. The surcharge would be collected before the passenger is transported on their next Special Services trip.

#### Impact on Operations

No-show passengers are a significant problem in specialized transportation systems, especially when requests must be made days or sometimes even weeks before the day of travel. The further ahead the request is made, the more likely the trip will be forgotten or that plans will change. CTA's Special Services program avoids most of the no-show problems by limiting single-time trip requests to one-day advance reservations. Interestingly, of the five no-shows on the sample day examined, three were standing-order (99) reservations and two were single-time trips (0). If this sample data is indicative of a more serious or at least equal problem on no-shows with standing-order passengers than with single time passengers, an additional penalty for repeated no-shows might be warranted above the surcharges. The granting of a subscription trip is a very significant privilege of limited availability due to the capacity of the system. Repeated no-shows -- say two or three consecutive months with 3 or more no-shows -- could result in a review of the individual's no-show record and possible forfeiture of their standing reservation privilege.

There is no question that such a policy could seriously impact the repeated no-show passenger if it were acted upon. The policy is not to



punish the individual, but to ensure that the Special Services program is able to provide effective and responsive service to the many Chicago residents who need its services.

Regarding the new no-show policy, the surcharge would be expected to create its own problems to the extent that it must be used. No-show passengers will object to the amount of the surcharge and that it must be paid before their next trip.

#### LATE POLICY

As noted above, this policy has been approved by the Advisory Committee and will be implemented in July 1984.

The existing Special Service policy allows a passenger a "grace period" of 5 minutes after the promised pickup time on their outbound or initial trip and 10 minutes on their return trip. Failure to show up after this grace period constitutes a no-show (as discussed above). The existence of the grace period has been increasingly taken advantage of by some Special Service passengers -- showing up just before the end of their grace period. As CTA staff has pointed out to the Advisory Committee, these late appearances have a "snowball" effect and result in the vehicle being late for all its scheduled trips.

The proposed late policy will consider the rider "late" if the vehicle arrives on time and the rider is not ready at the prearranged pickup time/place. The operator will call the dispatcher who will attempt to telephone the passenger to determine if they will be ready in about 5 minutes -- if so, the operator will be instructed to wait an additional 5 minutes. A surcharge will be collected each time it becomes necessary for the operator to call the dispatcher: \$1.00 for the first occurrence in a 30-day period, \$2.00 for the second occurrence, and \$5.00 for the third occurrence and any additional during a 30-day period.

#### Impact on Operations

As noted with regard to the surcharges for no-shows, the surcharge itself can be expected to create some criticism and perhaps some operational problems in terms of collection.





Overall, the strengthened policy on lateness can be expected to improve the system's on-time performance and reliability. Interestingly, as riders begin feeling they can expect the system to be on-time, they themselves will make a better effort to be on time, thus enhancing the system's reliability.

Generally, demand-responsive systems -- either general public dial-a-ride or special elderly and handicapped services -- have very tight requirements for passengers to be ready at the time promised due to the "cascade" effect on all other passengers that a vehicle has on-board at any moment or will pick up later in the day. Most systems allow the operator to wait only 2 or 3 minutes for the passenger to appear, although it is common for the dispatcher to attempt to telephone the passenger to inform them that their vehicle is waiting.

In addition to the surcharge, it is critical that the dispatcher or Special Services Superintendent personally follow up each violation to explain the policy, surcharge, and the importance of timeliness and reliability to the system and one's fellow passengers. Most services find that this individual attention usually results in few repeat offenders.

#### CANCELLATION POLICY

This policy, too, has been reviewed and a new policy has been approved by the Advisory Committee.

Under the present cancellation policy, 5 late cancellations -- that is any cancellation within 4 hours of the promised pickup time -- would be grounds for a 30-day suspension of Special Services privileges.

The proposed cancellation policy will specify that cancellations must be made at least 4 hours prior to the scheduled trip. To facilitate cancellations, a telephone answering device is being installed at the Washington Garage specifically to record cancellation calls when the offices are not open. Because unforeseen events do lead to trip cancellations on short notice, two late cancellations will be allowed during a 30-day period without any penalty. Beginning with the third late cancellation, however, a surcharge will be assessed: \$1.00 for the third





occurrence, \$2.00 for the fourth, and \$5.00 for the fifth and subsequent late cancellations.

#### Impact on Operations

Earlier comments on the economic impacts of the surcharges on Special Service clients and possible problems with collection apply.

The proposed cancellation policy should have the desired effect of encouraging cancellations sufficiently early to allow the scheduling of another trip into that capacity. On our sample day of February 23, 1984, 451 trips were carried and another 26 trips -- equivalent to almost 6% of the provided trips -- were cancelled on the day of service and probably represent unused capacity. Of these 26 cancellations, they were almost equally split between standing order trips (12 cancellations) and one-time trips (14 cancellations).

The proposed late cancellation policy may actually have the very unintended effect of increasing no-shows. If a passenger has incurred four or five late cancellations but no no-shows during a 30-day period, they could choose to incur a first no-show at a surcharge of \$1.00 rather than a fifth late cancellation at a cost of \$5.00. The policy needs to be reviewed and changed so that the penalties work together rather than separately.

#### MAXIMUM RIDE TIME

In providing transportation for the handicapped, the length of their ride or trip times is a matter of passenger comfort as well as service quality. Although not identified explicitly as a study issue, the identification of several very long ride times during early data analysis led to further investigation. To determine the system's performance on trip times, two days were selected -- February 1 and 23 -- and then the trip times were calculated for every other or every fourth run on those days. The results of this analysis are shown in Table 2-14.

These findings show that 52% of the sampled trips were completed in 30 minutes or less and only 19% of the trips involved a ride of more than 60 minutes. Apparently, Special Service's informal policy of limiting



TABLE 2-14

## TRIP TIME ANALYSIS

Total Trip Time	Number of Trips		Combined Results	
	02/01/84	02/23/84	Total Trips	Percent
0-15	27	22	49	23.2%
16-30	18	43	61	28.9
31-45	20	20	40	18.9
46-60	7	14	21	10.0
61-90	12	20	32	15.2
91-120	3	5	8	3.8
121+	0	0	0	0
Total	87	124	211	100.0%



trip times to less than 90 minutes except for very long trips is being followed.

While we do not find any serious problems with the length of time passengers must ride in the Special Services system, these figures may indicate that passengers are frequently given extraordinary service -- that is, very short trip times -- and that system productivity could be increased by fitting a few more trips into these tours and, consequently, making the passengers ride a bit longer.

#### SUBSCRIPTION SERVICE POLICY

The Special Service program provides trips according to single time requests made on the day prior to the desired service day and according to standing reservations or "99s." Subscription trips or standing reservations are established on a space available basis, not to exceed one-half of the program's service. As discussed earlier in this section, most subscription reservations were arranged when the Special Service program began in September 1981 and the waiting list for subscription trips contains many people who have been waiting since that time.

Subscription trips must be made at least 3 times per week and must be to the same destination. There are no limitations as to the trip purposes which can be served through subscription trips.

Of the approximately 450 one-way trips carried each weekday, one-half, or 225 trips, are subscription trips. These one-way trips represent about 112 different people making one trip per day to a destination and then a return trip. If we assume that the average subscription user takes their subscription trip 4 days each week -- and the actual rate may be closer to 5 days per week -- then only about 187 different individuals are being served by the subscription portion of the Special Service program. At a per trip cost of \$26, each of these 187 subscription users is being provided service worth \$10,816 per year.

On the other hand, the deferred or single-request half of the service -- also providing about 225 one-way trips per day -- can provide another 112 round trips per typical weekday. Because these trips are



scheduled on a first-come-first-serve basis, the service is theoretically available daily to all 5,700 registered Special Service users.

The dual scheduling approach described here raises very difficult issues of equity in the distribution of the program's transportation services and of the basic purpose of the program. On one side, the provision of subscription trips indicates that a strong objective of the program is to provide the high frequency, reliable transportation needed by the handicapped to secure and hold jobs and to pursue schooling or rehabilitation. But by providing this high level of service to a limited number of program clients, an issue of equity can be raised because such a large proportion of these limited services are committed to such a small number of the eligible population. Should not eligible citizens have an equal opportunity to obtain a trip?

There is no easy answer to this dilemma. The need of the handicapped for regular transportation for purposes of work and school is undeniable. Similarly, so long as services cannot be drastically increased, the question of equitable distribution will remain. Although having a marginal impact, there may be a few strategies for more equitably distributing the program's transportation services:

- Limit subscription trips to specific purposes. Presently, CTA policies allow subscription trips for any trip purpose. Because of the very limited and special nature of these subscription privileges, it may be reasonable to restrict them to certain high priority purposes such as work trips and school.
- Limit length of time subscriptions can be temporarily cancelled. Subscription clients can place a temporary cancellation on their trip for an unspecified length of time. Although inactive, this suspended subscription trip is still taking space in the subscription portion of the service, preventing the system from extending subscription services to those on the waiting list. To eliminate the potential of extended temporary cancellations and encourage some turnover in subscriptions, it would be reasonable to limit temporary cancellations to perhaps 30 or 60 days maximum.



Ultimately, the effect of actions such as those described above is minimal in the face of the travel needs of almost 20,000 Chicago residents. Given the limited quantity of services, the most equitable arrangement would be to make all Special Services available only to single trip requests rather than half subscription and half individual trip requests. This change would result in a more equitable distribution of services, yet alternative transportation would need to be arranged for present subscription users.

#### SPECIAL TRIPS TO NON-HANDICAPPED ELDERLY

In the course of our investigations, it was found that the Special Services program currently provides group shopping trips to about 25-30 non-handicapped elderly citizens on Saturdays and 15-20 individual church trips to non-handicapped elderly on Sundays. These trips were begun during the early development of the Special Services program in order to use uncommitted vehicles on the weekends and to generate added ridership.

It is not our intent to question the importance and value of these trips to their elderly recipients, but rather to point out that trip requests from eligible clients are being turned down on Saturdays and Sundays, and that a precedent is being established by providing trips to only a special few non-handicapped elderly out of many in the city. Analysis of system records shows that an average of 10 requests are turned down for Saturdays and 15 requests turned down for Sunday trips.



SUBSECTION 2.3  
PERSONNEL ANALYSIS

The objective of this subtask is to review the background, abilities, and qualifications of CTA personnel involved in the administration, supervision, and scheduling/dispatching of special services. It is complemented by another subtask of the Manpower Analysis wherein the specifics of the scheduling/dispatching function are reviewed.

1. A TOTAL OF 66 INDIVIDUALS COMPRISE THE CURRENT SPECIAL SERVICES STAFF

Of this total, 64 are located at Washington Garage and work on special services exclusively. The remaining two are located at CTA headquarters -- one in operations planning and one in the treasury. Many other individuals at headquarters assist and oversee the program. However, their time commitments to special services are minimal (i.e., less than ten percent of total time) and, therefore, have not been designated for this discussion as special services staff. Their roles will be discussed, however, in the later analysis of the organizational structure (Task 5).

1) The Washington Garage is the Responsibility of a Superintendent - Transportation Personnel

Unlike other garage superintendents at the CTA, the Washington Garage superintendent performs both personnel and service-related functions. He must handle the counseling and discipline aspects of the personnel role

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Note: This analysis was conducted in the Spring of 1984 and describes conditions in effect at that time. It should be noted, however, that an internal reorganization of the Operations Division took place in June 1984. Its impact on Special Services was a promotion of the Washington Garage Superintendent to Director of Special Services and the assignment of a new Superintendent from within Transportation Personnel. The Director of Special Services reports directly to the Manager, Transportation Personnel.



while also assuring that service on the street operates smoothly. Also, given the nature of special services, the position of the WashingtonGarage Superintendent requires much more involvement with the community than the other garages. This involvement occurs in the form of daily phone calls from users and monthly meetings with the advisory committee. Presently, the superintendent reports to an area superintendent. A planned reorganization within the Transportation Department will raise the top position within Special Services to the "Area Superintendent" level. A new Superintendent will be assigned to Washington Garage at this time expand- ing the supervisory staff by one.

2) Five Assistant Superintendents Oversee the Day-to-Day Operations of Special Services

The five assistants are scheduled to span all hours that special services operates. They oversee the onstreet delivery of service. In this role, they perform radio dispatching and respond to any in-service developments that may arise. The assistants oversee the subfunctions within special services and generally assist the superintendent in keeping services and personnel under control.

All six of these individuals (the superintendent and five assistants) have been promoted from within the Transportation Department, having served formerly as operators or in other first-line supervisory positions on the Authority's fixed-route system.

3) Forty-Four Operators Are Assigned to Washington Garage

As special services is considered a desirable assignment, it has attracted the most senior operators within the CTA. Weekday service utilizes 40 operators; an extra board of four is retained. In addition, a "pool" of five operators throughout the system has been designated for

back-up assistance. They are rotated into the garage periodically as a refresher to special services until permanent assignments become available.

The work rules, bidding and seniority provisions for special services were established in close consultation with the operator's union prior to the start of the program. The cutting of runs is performed by Operations Planning. Sixty percent of the service is scheduled with eight-hour runs (24 of 40 assignments). Only seven weekday runs exceed nine hours, with the maximum being 9.4 pay hours, due almost entirely to . paying a spread premium for a split run (e.g., one which operates only during peak hours).

4) Five Clerks Perform All Necessary Clerical Duties

Each CTA garage has a clerical staff. At Washington Garage, a Chief Clerk supervises four other individuals in handling the various administrative tasks such as payroll, revenue processing, correspondence, and service-related information. One of the clerks has assumed the majority of the work relating to data entry and report production which involves use of the CRT and, accordingly, he has the highest proficiency in its applications. Two others limit their efforts primarily to telephone answering and follow-up as well as other small tasks for the other clerks and superintendents.

5) A Scheduling Staff of Nine Receives Trip Requests and Develops Vehicle Tours

The scheduling positions are defined as "special services representatives" and report to a supervisor of special services scheduling. Their basic duties are:

- . Answering the telephone and recording passenger trip requests;
- . Scheduling trip requests into complete vehicle tours;
- . Calling passengers to confirm or deny requests for service; and
- . Entering trip information from the previous day's service ("trip history posting").

The scheduling staff starts work at 8:00 a.m. The first hour is spent exclusively on answering the phone and preparing trip request forms. When the volume of incoming calls lets up, the process of tour building begins. Simultaneously, trip history posting activities can begin if time and trained personnel are available. By mid-afternoon, the major activity of all scheduling personnel shifts to making and answering calls to verify the next day's trips. Those individuals who have not been contacted by 4:00 p.m. when the scheduling staff's work day ends are treated as follows:

- . On selected days, one person is scheduled to work the hours of 10:00 a.m. to 6:40 p.m. and spends the last hours notifying callers of the final schedules; and
- . When all scheduling staff depart, trip request forms for those not notified are given to the assistant superintendent for follow-up action.

The skill level of the scheduling staff varies among the eight individuals. Combined, they schedule approximately 175 to 200 trips each day. As the analysis of scheduling procedures has identified, on any given day, the performance of individual schedulers consistently can range from low performers at 14 trips to high performers booking 41. This translates to a production level ranging from 2 to 6 trips booked an hour. In addition, those individuals who develop more competence with the scheduling function's procedures also perform the trip history posting and other administrative activities; therefore, they spend even less time on actual tour building.

An appropriate system to compare this with is Cleveland's, upon which the CTA's is modelled. The Greater Cleveland Regional Transit Authority's special services program is operated by 19 scheduling and administrative personnel, a comparable number to the staff at Washington Garage. However, they dispatch 57 vans (compared to 42) and transport 35,000 passengers monthly (compared to 12,500). Accordingly, GCRTA has established a minimum scheduling standard of 40 trips per hour. Schedulers must exceed this by ten percent (44 trips per hour) for 12 out of 15 months before being promoted.

Baltimore's program relies on a 15 van fleet and a contract with a local taxi company. It transports approximately 9,500 trips per month which are handled by only two schedulers -- one schedules subscription trips, the other schedules those requesting service 48 hours in advance.

6) One Certifier Processes Applications for Special Services Eligibility

Each user of special services must first request an application. This is returned with required attachments to the CTA, whereupon eligibility is determined. This process is the responsibility of one certifier, now located within the Group Sales Department of the Treasury at the Merchandise Mart. The certifier's primary responsibilities are:

- . Processing applications
- . Responding to telephone inquiries
- . Preparing a monthly report on certifications

As Exhibit 2-9 illustrates, the volume of applications received and certifications processed in any given month has been declining gradually but consistently since the program's start. In 1984, with relatively consistent monthly ridership volumes, less than 150 applications are being received and processed in an average month.

EXHIBIT 2-9  
CTA SPECIAL SERVICES ANALYSIS  
VOLUME OF APPLICATIONS AND CERTIFICATIONS

<u>Year</u>	<u>Applications</u>		<u>Certifications</u>	
	<u>Total Received</u>	<u>Monthly Average</u>	<u>Total Received</u>	<u>Monthly Average</u>
1981(a)	1,450	483	1,102	367
1982	2,970	248	2,603	217
1983	1,930	161	1,558	130
1984(b)	526	132	443	111

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(a) Beginning September 1981

(b) Through April 1984 only

Source: Monthly status reports from special services certifier

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The entire certification process is manual. A copy of a completed record is sent to Washington Garage through CTA's internal mail whereupon a client file is created on the computer for subsequent trip requests.

As a member of the Group Sales Department, the certifier also assists on an as-needed basis in other activities (e.g., selling passes and issuing identification cards for various reduced fare programs). This constitutes an average of ten percent of a typical day's activities.

7) A Principal Planner Within Route & System Planning Has Been Designated as the Project Manager for the Special Services Planning Activities

This role has been developed through involvement in all of the CTA's planning for elderly and handicapped persons, most notably the response to Section 504 which led to the creation of Special Services. In this role, the planner serves as a contact point for monitoring the service, responding to special inquiries regarding the service from other staff members, interacting with other local agencies, and coordinating the efforts of the CTA's Advisory Committee on services for the Disabled.

Special services activities require, on average, 30 to 40 percent of this individual's time. Depending on the issues at hand, however, this can range anywhere from 10 to 90 percent. Balancing these responsibilities are the other service planning activities routinely performed by the department.

2. GARAGE PERSONNEL UNDERGO A SPECIAL SCREENING BY THE SUPERINTENDENT PRIOR TO THEIR SELECTION AND ASSIGNMENT

Candidates for available positions within Special Services are identified through the routine procedures followed by the personnel department. They are



then interviewed by the Superintendent of Washington Garage. He follows-up by submitting his comments on the interviewee's suitability for the position to the personnel department which executes a final assignment decision.

1) The Operators, Clerks, Schedulers and Assistant Superintendents All Were Interviewed by the Superintendent

The perception of the staff is that the initial work force was "hand-picked" by the Superintendent based on their sensitivity, commitment to the project, and ability to work together as a team. Over the life of the project, there has been very little turnover in personnel. Since its start-up, however, there have been instances where individuals have been assigned to Washington Garage, overriding a negative assessment by the Superintendent and his assistants.

2) The Screening Interviews Are Keyed to the Unique Demands of Special Services

A standard set of questions exists for pre-screening and interviewing operators and schedules; a written questionnaire was prepared for the Supervisor - Scheduling position. Selected questions from the various guides are presented in Exhibit 2-10. Omitted from this list are those relating to supervisory responsibilities (e.g., "Do you think that it is important to get along with the people you supervise?"). The questions focus on two particular areas:

- . Attitudes, sensitivity, and direct experience with handicapped individuals; and
- . Flexibility and commitment to perform those aspects of the job which may be different than any other positions within the CTA.

EXHIBIT 2-10  
CTA SPECIAL SERVICES ANALYSIS  
SELECTED INTERVIEW QUESTIONS

Sensitivity

1. Have you had any contact with any disabled persons?
2. Does seeing disabled persons affect you in any way?
3. Do you feel that disabled persons are sick?
4. Do you feel that disabled persons are different from able-bodied persons? If yes, why?
5. Are you handicapped in any way?
6. Tell me in your own words what you think "handicapped" means.

Job Requirements

1. Will you be willing to be flexible about your fallback (lunch)?
  2. How do you feel about personally assisting a severely disabled person?
  3. Have you had any back problems in the past two years, including injuries?
  4. Would you be willing to take sensitivity training concerning disabled persons?
  5. Do you like working with people?
  6. Schedules may be severely disrupted during inclement severe weather. Are you willing to spend the time and effort that will be necessary to complete our function on such days?
  7. Have you had training on computer terminals before? What type?
  8. Are rules and regulations important to you?
  9. Are you capable of doing what you are told to do?
-

Many of the questions are leading in their wording, thereby suggesting the desired response (e.g., Do you feel that disabled persons are different from able bodied persons? Would you be willing to take sensitivity training? Are you capable of doing what you are told to do?). Similarly, the interview does not emphasize the skills necessary to perform the job such as knowledge of Chicago streets, proficiency with computers, and direct service experience with the public. While some of these issues and overall personality characteristics may be checked through the candidate's personnel file, the emphasis from these interview guides appears to rest solely on a qualitative assessment of an individual's personality and compatibility with the prevailing special services philosophy.

3. STANDARD JOB DESCRIPTIONS DO NOT REFLECT THE DISTINCT REQUIREMENTS OF SPECIAL SERVICES

As part of this personnel analysis, job descriptions were requested for the administrative, supervisory, and scheduling positions within special services. The following position descriptions were provided for this review:

- Superintendent III, Transportation Personnel (M-3), revised 9/7/83
- Assistant Superintendent II, Service (M-4), revised 12/20/82
- Supervisor, Special Services Scheduling (M-4), revised 4/21/83
- Special Services Representative II, (P-7), revised 4/21/83
- Special Services Representative III, (P-8). revised 8/6/81
- Chief Clerk, revised 7/16/70
- Clerk, established 4/5/76

All but the two clerk descriptions have been written and/ or revised since the advent of the special services program. Nonetheless, the existing position descriptions exhibit shortcomings which impair the assessment of special services personnel.

1) Existing Position Descriptions Are Not A Fully Accurate Depiction of Special Services Staff Responsibilities

As described previously, the Superintendent's and Assistant Superintendent's responsibilities span both the personnel and service sides of the operation. Similarly the assistant superintendents perform the dispatching function for their vehicles and handle scheduling for same day trip requests as adjustments become necessary. There is also an unusually high amount of interaction with the riding public, including attendance at advisory committee meetings and other community functions.

The Superintendent and Assistant Superintendent positions descriptions relate to the traditional functions of the CTA's Transportation Department. Reportedly, the individuals holding these positions at Washington Garage prepared and submitted new descriptions tailored to their unique duties and responsibilities. These were not provided for this analysis. It is not known if these distinct special services position descriptions have been approved by the Transportation Department.

The various scheduling position descriptions were first prepared by the Washington Garage Superintendent in the Spring of 1981, as part of the planning for service initiation. Hence, they are keyed to the expected responsibilities and position requisites. However, they do not differentiate among the tasks performed by the more proficient scheduler (e.g., trip history posting).

The clerk description was prepared in 1976 and has not been revised at all since then (except for changes in department assignment). As written, this position relates to the processing of riding passes for handicapped individuals (for reduced fares on the buses and elevated). It can be extended in present form to describe the work of the certifier. The chief clerk position description originally was prepared in 1948 and has remained unchanged for 14 years. As it was last revised in 1970, it

is not surprising that it makes no reference to data processing activities and proficiency in the use of the garage's CRT. Despite its agedness, this particular position description is the most comprehensive and task-specific one of the group.

2) Position Requisites Are Inconsistent Within and Across Job Categories

The position description for the superintendent and schedulers define requisites in three areas -- position, educational, and experience. These are undefined for the clerk position. In most cases, these thresholds are so ambiguous that they do not serve to exclude a candidate. Discussions of the shortcomings and inconsistencies in these three areas of descriptions follow:

Position Requisites - The requisites specified for the Superintendent and Assistant Superintendent emphasize traditional service. Though these aspects are important to Special Services, they are not the sole focus. Absent from the position requisites is any knowledge of disabilities, experience in dealing with handicapped individuals, nor successful completion of sensitivity training and passenger assistance programs. This familiarity is required of the scheduling staff. However, specific absences from the requisites for the Special Services Representative I include:

- . Experience and proficiency in the use of CRTs;
- . Minimum typing speed, particularly since the Representative is charged with typing responsibilities; and
- . Knowledge of special services regulations and guidelines.

Nor is there any requirement for scheduling process familiarity, spatial perception capabilities, or knowledge of operator work rules around which the schedules are built.

Educational Requisites - For all positions, the general statement regarding the educational requisite is "required to possess a combination of education and experience relating to this position". For the service representatives, training is included along with education and experience as a prequalifier. Neither the amount of education, training or experience nor the areas of specialization are stipulated in these requisites. The only academic requirement is specific for the supervisor of scheduling as a Bachelor's Degree in Business, Social Services, or the Social Sciences. However, even in this situation, there is a trade-off permissible stated as "a combination of education and experience relating to this position".

Experience Requisites - The number of years' experience is not defined for any position. However, the type of work performed previously is. There is great variety in these experience requisites:

- Superintendent III - demonstrated proficiency at the Superintendent II level
- Assistant Superintendent II - prior experience as a Bus or Rail Supervisor or Instructor
- Supervisor, Special Services Scheduling - prior experience in a social service capacity is required
- Special Services Representative - must be experienced in providing special services to the public

Physical demands are defined only for the service representatives. While the primary duties in these position descriptions emphasize the use of the telephone and a CRT screen and keyboard, and the position requisites include the need to speak in a clear, understandable manner, the physical demand statement does not follow through with this. It states only "required to have good, or corrected, vision and hearing". There is no mention of speech capabilities required for the telephone or manual dexterity required for the keyboard and telephone.



4. LACK OF CLEARLY DEFINED BENCHMARKS AND OBJECTIVES IMPAIRS THE ASSESSMENT OF SPECIAL SERVICES STAFF PERFORMANCE

Unclear job descriptions and the lack of performance objectives makes it difficult to judge if the individual staff members are performing at an acceptable level. Staff evaluations are made annually by the Superintendent of Washington Garage using the standard CTA evaluation form for executive, managerial, and professional staff (Exhibit 2-11). Though the first factors judged are job knowledge, quality of work, and productivity, there are no universal thresholds which would aid in determining if performance could be deemed suitable. Absent these parameters, evaluations of the staff are made on a "sliding scale."

An example of this sliding scale approach is evident in the schedulers group. Though records are maintained of the number of trips booked daily per person, there is no clear requirement for satisfactory performance. Thus, performance can range from an average of 14 to 41 trips per day per person. In this situation, the person scheduling 41 trips is the "star" of the group. Yet, there is no sense if this top-level of achievement is exceeding an expected performance level, right on target, or below average.

Even so, the top person's performance is not used to establish a standard for the other schedulers. Rather, they are judged by their own individual improvements. Therefore, a person scheduling only 14 trips a day, though well below that of the top achiever, might be given an outstanding rating if in prior years they were scheduling less than 10 trips per day. In this same scenario, the person scheduling 41 trips might have actually fallen off from previous years and therefore might receive a negative assessment.

\* \* \* \* \*

It is recognized by participants and observers of the special services program that there is a broad range of capabilities and performance within the special services staff. However, there is no pre-established definition of

## EXECUTIVE/MANAGERIAL/PROFESSIONAL INTERVIEW EVALUATION

EXHIBIT 2-11

NAME: \_\_\_\_\_ STATUS: ☐ Employee ☐ Outside Applicant  
PRESENT POSITION: \_\_\_\_\_ DEPARTMENT: TRANSPORTATION  
CURRENT LEVEL OF RESPONSIBILITY: \_\_\_\_\_ SALARY: \_\_\_\_\_ Monthly \_\_\_\_\_ Annually \_\_\_\_\_

INSTRUCTION TO INTERVIEWER: After the interview has been completed and the applicant reports, indicate your rating for each factor by checking each appropriate space. Enter your recommended disposition and signature and forward to the Placement Office for final processing.

FACTORS	NOT SUITABLE	SUITABLE	VERY SUITABLE	COMMENTS
1. Job Knowledge				
2. Quality of Work (For Present Employees Only)				
3. Productivity (For Present Employees Only)				
4. Judgment and Decision Making				
5. Leadership and Supervisory Ability				
6. Effectiveness in Communication				
7. Stability				
8. Organizational Ability				
9. Initiative				
10. Creativeness				
11. Capacity for Advancement				
12. Attitude and Spirit of Cooperation				
13. Personal Appearance				
14. Outside Interests				
15. Attendance (For Present Employees Only)				
16. Overall Evaluation				

DISPOSITION: ☐ Acceptable ☐ Not Acceptable

SUMMARY OF EVALUATION: \_\_\_\_\_

RECOMMENDED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

James Bond  
INTERVIEWER

Supt. Special Services  
TITLE

DEPARTMENT MANAGER

DEPARTMENT

DATE

DATE

expected level of performance for each staff position. Therefore, there is no benchmark against which they can be judged. Just as the job descriptions do not serve to preclude a candidate for a position, nor do they enable an assessment of a person's performance as excellent, satisfactory, or unsatisfactory.

This lack of performance parameters is evident throughout the whole of the special services program. As the organizational analysis will depict, there is an overall lack of mission for the program and an understanding of its role within the whole of the CTA. This lack of guidance "trickles down" to the operating garage where it becomes evident in the current situation of the special services personnel. Resolution of this condition must start with a clear mission statement for special services to which supporting documentation such as policies and procedures, performance requirements, and position descriptions can be oriented. With this policy framework in place, a number of personnel-related improvements can be made. Four recommendations are offered:

5. REVISE JOB DESCRIPTION FOR ALL SPECIAL SERVICES PERSONNEL

The full range of requirements and responsibilities of the special services staff should be clarified in terms of their duties and skills. Distinctions among various grades and positions should be defined clearly and consistently. Thresholds for satisfactory performance and promotion should be established. Variations from similar positions elsewhere (e.g., the superintendents' responsibilities in both the personnel and service areas or the clerk's CRT skills) should be noted in order to ease the promotion and transfer of individuals among CTA garages.

These revisions should be incorporated into new job descriptions for each of the program participants. The assistance of trained personnel specialists from the CTA's human resources department should be sought in this regard.

Each staff member should be provided a copy of their specific job description (and for comparative purposes, a copy of the one for the position immediately above and below their own, if requested).

6. EXPAND THE MONITORING OF INDIVIDUAL STAFF MEMBERS' PERFORMANCE

Current procedures call for the informal recording of each schedulers' performance with respect to trips booked per day. This reporting process should be expanded, in conjunction with the thresholds established in the new descriptions (e.g., trips booked per day or per hour; time spent on each key activity such as call intake, tour building, trip history posting) as well as those for the scheduling function as a whole suggested in later tasks of this study.

Given the confidential nature of this information and its relationship to possible hiring and promotion decisions, it should be removed from the schedulers themselves. Rather, it should be performed by the superintendent staff each evening when the scheduling day is over and summarized on a monthly basis. The format for the latter should be prescribed by the operations planning staff as part of the overall service monitoring program being recommended for implementation.

7. ADOPT FORMAL STAFF SELECTION AND HIRING PROCEDURES

Many of the procedures now occurring within special services are contingent upon the extra efforts and personalities of key individuals. When one of these key individuals is indisposed (e.g., by illness, vacation, or competing demands), the procedure can not be carried out effectively.

More structured procedures are being recommended for numerous activities within the special services program to assure the continued and consistent

performance of key functions. The review, selection, and hiring of program staff should be included in this effort. A personnel "handbook" should be developed incorporating all related personnel materials into a single source document, including at a minimum the following required forms and information:

- . job descriptions for all relevant positions;
- . screening forms for reviewing all applicants;
- . interview form for final candidates being considered;
- . staff monitoring forms for daily, monthly and annual tracking and appraisals;
- . promotion forms for documenting an individual's qualifications for advancement;
- . new staff requisition forms; and
- . appropriate CTA equal employment opportunity and affirmative action policies.

The assistance of the human resources department should be obtained in assembling those materials which now exist; developing new forms appropriate to the special services program; and preparing clear instructions on the proper execution of each key activity. When completed, personnel specialists should conduct a training session in interviewing, hiring and supervision for those program staff entrusted with these responsibilities and orient them to the materials in the handbook.

#### 8. REVIEW STAFFING NEEDS AGAINST THE ADOPTED PERFORMANCE STANDARDS

Implementation of the performance requirements, monitoring activities, and standard procedures defined above will provide the necessary information on which to base staffing level decisions. Based on a review of activities now performed and numbers of employees involved, it is believed that the current

staff could perform more efficiently even at a reduced level. This is particularly so for the schedulers and clerks positions. Clear definition of their responsibilities and required performance levels will define the extent to which the staff has been expanded unnecessarily. Monitoring of individual staff performance will identify those able to effectively support the program's activities as well as those better suited for reassignment.



## SUBSECTION 2.4

### COMPUTER SYSTEM ANALYSIS

#### OVERVIEW

Scheduling and administration of the Special Services program is carried out using a computer software package leased from Transit Systems Unlimited of Akron, Ohio. This computer system has been in use since the initiation of Special Services operations in September 1981, and was originally developed for and used in Cleveland Regional Transit Authority's Paratransit service.

Given three years of use of the computer system and some differences between Cleveland's services and procedures and those in CTA, this task is intended to analyze the computer system relative to procedural efficiency, management support, and overall effectiveness and to suggest possible enhancements for improving present and future effectiveness. Because the computer software being examined is a leased system and protected as proprietary, this analysis is based on observation of the system in use, examination of system output, discussions with operating and management staff, and telephone conversations with the operators of the Cleveland system.

#### COMPUTER SYSTEM DESCRIPTION

The scheduling software\* is operated on a dedicated Basic Four mini-computer located in the Special Services offices at CTA's Washington Garage. Fourteen terminals are connected to the computer, and there are no remote terminals in other CTA locations (e.g., the Merchandise Mart) and no data-link between CTA's mainframe computers and the Special Services machine.

The system could best be characterized as a computerized filing or record system, as it only facilitates and does not actually schedule any passenger trips to service vehicles. The system maintains basic data on each client, allows for development and modifications of individual vehicle

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\*The program is formally known as the "Demand/Response Transit System."



tours, accumulates performance data, and can generate a variety of valuable reports and performance measures. The major system components and their use are described in the remainder of this section.

### Client Files

The Demand/Response Transit System or "D/RTS" contains a number of information files, however, Client Files are among the most basic and important of these. As shown in Exhibit 2-12, the Client File contains the client's name, address, handicap code, emergency contact, and several other items. Once a new applicant has completed the certification process and is found to be eligible as a handicapped resident of Chicago, their client data is forwarded to the Special Services superintendent at Washington Garage, who enters that individual as a new user. A client's file is accessed by entering the individual's phone number or last name if the client has no phone.

At the present time, the "Additional Information" space at the bottom of Exhibit 2-12 is used to record the relationship of the emergency contact to the client -- for example, father, mother, son, etc. Other than this position, there is no programmed space for recording the client's actual use records or problems (chronic no-shows or late cancellation violations) in the client file.

To schedule a trip request, the scheduler uses the Trip Entry function. The first step is to enter the client's phone number, which causes the computer to display a brief client identification on the bottom 1/4 of the terminal screen. This display includes space to input the data for the desired trip, yet does not have the capacity to flag problems or special conditions relating to that client.

### Tour Scheduling

Once the client's eligibility is verified and basic trip request data entered, the scheduler is able to search for an efficient vehicle tour on which to schedule that client's trip. The D/RTS program begins each day with "starter" tours comprised of the standing order reservations for that day of the week. As trips are scheduled each day, the computer records



## CLIENT FILE

TAUD40-A

3.1 CHICAGO TRANSIT AUTHORITY 02/23/84

## \*\*\* CLIENT FILE MAINTENANCE \*\*\*

PHAME	XXXXXXXX
SUFFIX	00
NAME	XXXXXXXXXXXXXX
STREET NUMBER	#####B
STREET NAME	XXXXXXXXXXXXXX
ZIP CODE	00000B
CITY	XXXXXXXXXXXXXX
HANDICAP CODE	X
DISABILITY CODE	XX
ALTERNATE TRANSPORTATION CODE	XXXX
ALTERNATE TRANSPORTATION CODE	XXXX
NEAREST INTERSECTION TO RESIDENCE	XXXXXXXXXXXXXXXXXX
DATE OF ELIGIBILITY	MM/DD/YY
EMERGENCY CONTACT NAME	XXXXXXXXXXXXXXXXXXXXXX
EMERGENCY CONTACT ADDRESS 1	XXXXXXXXXXXXXXXXXXXXXX
EMERGENCY CONTACT ADDRESS 2	XXXXXXXXXXXXXXXXXXXXXX
EMERGENCY TELEPHONE NUMBER	XXXXXXX
ADDITIONAL INFORMATION	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

the trip data in the proper chronological location on the selected vehicle tour record, so that later scheduling efforts are fully aware of the trips already committed to that vehicle.

As a start, the scheduler must have a general knowledge of what vehicle tours will be serving the area of the trip being scheduled, otherwise, the scheduler will waste time searching for an acceptable tour. Similarly, the scheduler must be able to mentally locate the origin and destination of the desired trip and determine if a particular vehicle tour could efficiently serve that trip without causing undue disruption to the previously-committed trips on that tour.

Once an efficient "fit" is found for a trip, the client name and trip data are inserted into the tour record, and the scheduler will then schedule that client's return trip or move on to another client's trip request. If, for some reason, that trip is later cancelled by the client, moved to a more efficient tour, or changed for some other reason, the D/RTS program is designed to leave the cancelled/changed trip data in the tour record and indicate its defunct status in a Status Code column on the tour record (see Exhibit 2-13). This procedure leaves a lot of extraneous, inactive trip data on each tour record, causing the schedulers to have to sort out active and inactive trips as they carry out their scheduling function.

After each day's scheduling is completed, the D/RTS program allows for printing of hardcopy tour sheets for the vehicle operators. These are picked up by the operators, and insertions or changes radioed to the operators during the day of service by the Special Services dispatcher.

#### Performance and Management Data

As service is provided, each operator is required to record data concerning vehicle usage and service performance. Following the day of service, Special Services staff utilize the Trip History Posting function to correct tour records as to number of passengers, cancellations, and no-shows, and to enter actual pickup and delivery times. On the basis of these trip performance and client data and other data including vehicle usage data, operator and scheduler identifications, the D/RTS program





DAY RUN VEH ST RN OPERATOR BADGE QUIT PO/PI  
TUE A56 107 5:25 BRUDNEY E. T. 5-835 13:00 10

NAME	ADDRESS	TC PHONE	HC PASS	S	SB	TIME	ACTUAL	S	ACT	PAS
HUCKS LeDORA	555 E 33RD PL	W 225-1792	C +1	J	0	5:45	5:45 X	+1		
HUCKS LeDORA	600 W. MADISON	W 225-1792	C	-1	J	0	6:00	6:00 X	-1	
GLENN WALTER	9611 S DOBSON	M 374-8537	C +1	\$	99	6:15	A	+0		
COLLINS CLAR	7140 S RHODES	W 994-8204	K +1	J	0	6:25	6:25 X	+1		
WILSON CAM	7318 S RHODES	W 723-2848	C +1	J	0	6:27	6:27 X	+1		
PARKER ODIE	7522 S VERNON	M 723-6437	+1	\$	99	6:30	6:30 X	+1		
WILSON CAM	230 S. DEARBORN	W 723-2848	C	-1	J	0	7:00	7:00 X	-1	
COLLINS CLAR	121 N. LASALLE	W 994-8204	K	-1	J	0	7:08	7:08 X	-1	
GLENN WALTER	251 E CHICAGO	M 374-8537	C	-1	\$	99	7:21	A	+0	
PARKER ODIE	251 E CHGO	M 723-6437		-1	\$	99	7:22	7:22 X	-1	
JACKSON REG	4037 S FEDERAL	W 268-9035	W +1	J	0	7:40	7:40 X	+1		
ROBINSON PAM	932 W 50TH ST	W 285-7268	W +1	\$	99	7:50	8:05 X	+1		
ROBINSON PAM	6033 S WENTWORTH	W 285-7268	W	-1	\$	99	7:55	8:15 X	-1	
JACKSON REG	6033 S. WENTWORTH	W 268-9035	W	-1	J	0	7:56	8:17 X	-1	
BARBOZA WILL	1642 W 62ND ST	E 436-3845	W +1	T	99	8:10	8:20 X	+1		
LES YAU SUN	518 W 32ND ST	W 225-0862	K +1	T	99	8:25	8:30 X	+1		
BARBOZA WILL	30 E LAKE	E 436-3845	W	-1	T	99	8:45	8:50 X	-1	
LES YAU SUN	443 N WABASH	W 225-0862	K	-1	T	99	8:57	9:00 X	-1	
OPERATOR'S	40 N MIN LUNCH	W 222-6100	+12	\$	99	9:10		+0		
OPERATOR'S	40 MIN LUNCH	W 222-6100	-12	\$	99	9:50		+0		
KIDWELL ESTH	2951 S KING DR	W 326-4022	C +1	J	0	10:00	9:50 X	+1		
KIDWELL ESTH	8 S. MICHIGAN	W 326-4022	C	-1	J	0	10:10	10:15 X	-1	
OPERATOR	15 BREAK	Q 222-6300	+1	\$	99	10:20		+0		
OPERATOR	15 MIN BREAK	Q 222-6300		-1	\$	99	10:35		+0	
PILARS HAZEL	400 E 33 ST	W 326-3972	C +1	\$	99	10:50	10:40 X	+1		
PILARS HAZEL	225 E 57TH ST	W 326-3972	C	-1	\$	99	11:00	11:00 X	-1	
GREGORY GLAD	8523 S COLFAX	W 375-6699	C +1	U	0	11:20	11:25 X	+1		
TURNER, THELM	8016 SO. ELLIS	M 483-0259	A +1	U	0	11:30	11:40 X	+2		
DAVIS, MAE	4747 S KING DR	M 536-7843	C +1	U	0	11:45	11:50 X	+1		
DAVIS MAE	3400 S INDIANA	M 536-7843	C	-1	U	0	11:55	12:10 X	-1	
TURNER, THELM	2600 S MICHIGAN	M 483-0259	A	-1	U	0	12:00	12:20 X	-2	
GREGORY GLAD	2 N RIVERSIDE	W 375-6699	C	-1	U	0	12:30	12:40 X	-1	

\* \* \* END OF RUN A56 \* \* \*

START MI. FINAL MI. MILES FUEL MI. GAS OIL TOTAL PASS. HOURS IN SERVICE  
28,657 28,757 100 22 0 14 6.9

offers a number of performance reports, as listed in Exhibit 2-14. As noted elsewhere in this report, these reports are not felt to be adequately used for monitoring of the Special Services program at the present time and, further, may suffer from questionable data collection procedures.

After an entire month's Trip History Posting is completed, Special Services staff print out copies of each day's Final Trip Sheets plus the performance reports for that month. The month's files are purged once all possible performance reports are completed and printed.

CTA's use of these reporting capabilities is also severely hampered by a lack of adequate training in the capabilities and use of the D/RTS software. Special Services staff have only recently discovered the availability of a travel/no-show/cancellation report by individual client by playing with the machine. Analysis of the D/RTS Procedures Manual failed to find any mention of this no-show/cancellation report capability.

#### CLEVELAND EXPERIENCE

CTA is presently using the third generation of the computer system designed specifically for the Paratransit Department of Cleveland's Regional Transit Authority. Cleveland's computer system has been somewhat enhanced to include word processing and spread sheet programs.

Cleveland's Paratransit program is organized on a zonal basis, with 18 zones varying in size from the downtown zone with 3.25 square miles to the largest suburban zone of 70.5 miles. The Paratransit vehicles are assigned to specific zones, and the zones grouped geographically into 4 groups, each handled by a scheduler team and accessed by different phone numbers.

Using essentially identical scheduling software, Cleveland schedules the daily tours for its fleet of about 100 vehicles, providing almost 1,800 trips on an average weekday. Of these 1,800 daily trips, only approximately 22 percent are standing orders, and almost all others are one-time advanced reservation trips. From the standpoint of the computer's capacity, Cleveland staff believe that they could increase their daily trips by half again without any computer programs. The system presently carries about 4.0





## AVAILABLE REPORTS

CHICAGO TRANSIT AUTHORITY  
REPORTSREP 1.2.8.6  
02/23/84TA REP- -  
PAGE 1

TA REP-

The Reports selector contains all reporting programs. These programs provide statistical information in a printed format for permanent storage. All reports provided are optional and are available on a daily, weekly, monthly, or yearly basis depending on the report involved.

The following list shows the available reports and the applicable periods:

	Daily	Weekly	Monthly	Yearly
Passenger Performance	X	X	X	X
Quality of Service	X	X	X	X
Passengers by Trip Purpose		X	X	X
Delays Report		X	X	X
Office Efficiency Report		X	X	X
Vehicle Performance	X	X	X	X
Failure Summary				X
Operator Performance		X	X	X
Major Generator Report			X	X

If several copies of reports are desired, it is best advised to make use of the spooling option when printing these reports. NOTE: Data for these reports are cleared using Period Clearing and are no longer available once a period (day, week, month, or year) is cleared. It is therefore essential that any reports that may be desired be printed before running Period Clearing.

TA REP-

passengers per vehicle service hour and has operated at productivities as high as 4.6 passengers per hour.

Cleveland's scheduling, unlike that of Special Services, is done dynamically as the trip requests are phoned in by the client. The scheduling operation has 10 staff on duty during the morning when most trip requests are received, and scheduling staff are used for other activities in the afternoon. Cleveland requires a high level of performance from their scheduling staff, establishing a minimum requirement of 40 trips scheduled per hour -- although most scheduling staff do 50-60 trips per hour. While the zonal organization of Cleveland's Paratransit program simplifies the scheduling process somewhat, another factor contributing to the performance of Cleveland's schedulers is their continuing training and exposure to the local street network and traffic conditions: each scheduler does 2 or 3 days of "ride-alongs" on a service vehicle each year.

Cleveland's experience with the same computer system as CTA demonstrates that the computer software has an inherent flexibility to handle different operating situations and is not limited in its capacity to meet the present and future demands of the Special Services program and that the computer system itself is not inherently to blame for the low productivity of the Special Services program.

#### POTENTIAL IMPROVEMENTS

The preceding analysis and observation of system operations has identified a number of potential changes to the D/RTS software or the way in which it is used which could improve Special Services' overall performance, procedural efficiency, and ability to monitor and manage the program.

Simplify tour records by eliminating cancelled and changed trip data. As noted earlier, the trip data associated with cancelled or otherwise changed trips presently remains in the tour record to which it was initially assigned. The process requires the schedulers to mentally eliminate these trips when searching for an efficient tour match, adding to the difficulty of their jobs and undoubtedly leading to some scheduling inefficiencies.



It is recommended that once a trip is rescheduled onto another tour, that that trip's data be eliminated from the original tour record. Further, if a trip is temporarily cancelled (an "A" cancellation), cancelled early ("E"), or cancelled for the benefit of CTA ("B"), that these trips be transferred to a dummy tour file and their trip data eliminated from the original tour file.

Related to this recommendation is the suggestion elsewhere in this report that cancellations until further notice ("A") be limited to certain time periods of perhaps 30 days.

Add client usage/note capability to assist schedulers. The present D/RTS software provides the scheduler with little client data during Trip Entry; if the scheduler wanted more client data they would have to enter a Client File Maintenance mode. As Special Services implements penalties designed to reduce no-shows and late cancellations, it will be increasingly important for scheduling staff to immediately know if their client is a frequent no-show or cancellation and if they owe an outstanding penalty assessment.

This change may require revision of the client file records to add data or renaming of existing records rather than reformatting the entire file. The change should affect both the complete client file and the client data which appears during Trip Entry.

Modify and utilize performance data capabilities for system monitoring.

[Performance measurement and monitoring are examined in detail within Section 1 of this report.]

As described briefly above, the D/RTS program includes the capability to provide a significant volume of needed performance and management reports. Unfortunately, these reports may be based on questionable data and are not presently circulated and examined on a regular basis. One specific error in the software involves the improper calculation of the statistic vehicle service hours. This statistic should include the elapsed time from the vehicle's departure from the garage to begin service (pull-out) until they



pull into the garage at the end of their shift and go out of service (pull-in), less lunches and breaks. Calculated in this manner, vehicle service hours is a measure of the total time during which vehicles are available for service, whether or not they were actively providing any trips. The current D/RTS process calculates vehicle service hours as the total time from first pickup to last dropoff, without any travel to and from these stops but including lunches and breaks.

Create computer file of turn-down requests. The dispatcher is daily provided with a folder containing all of the trip request sheets which were not able to be scheduled for that day. When a cancellation or no-show occurs, the dispatcher attempts to identify a turn-down which could be served in the now-available space. This process could be improved by making the turn-downs more easily accessible and by pre-sorting them possibly according to trip time and area. Using the printed tour sheet copy, the dispatcher could call up the turn-down list for the area where the vehicle will be and search for an alternate trip. If an efficient insertion is identified, the program might transfer that trip's data from the turn-down listing to the selected tour record, bringing that tour up to date.

Use function keys rather than menu for selecting functions. The D/RTS software requires the scheduler to constantly use an on-screen menu when changing from one function to another. To simplify the scheduler's actions in using the system, consideration should be given to using a terminal with function keys and revising the software should any major changes be undertaken with the software. This would involve a significant change and may be a capability to be sought in any new scheduling software.

Purge client files to eliminate inactive clients. Depending on the interior file handling of the D/RTS software, the responsiveness of the program may be affected by the volume of client files to be searched for a particular file. To ensure that inactive client files are not causing a negative effect on system response time, Special Services should purge its client



files on an annual or biennial basis of all those who have moved, become unable to use services at all, or who, for any reason, won't be using Special Services again. Such a purge of the files could be conducted by sending a letter to each client with a return postcard -- those who wish to remain in the client file would return the card. Clients who can't be located, have moved, or otherwise should be deleted from the file won't return their cards.

Establish direct entry of new client data by certifying personnel. Presently, certification of new clients is completed by staff in CTA's Treasury Department, and new client files are created by the Special Services Superintendent. To facilitate more efficient entry of new client data as well as update and verification of client data, we would recommend that consideration be given to placement of a computer terminal tied into the D/RTS computer in the CTA Treasury Department with the certifying personnel.\* Although this remote entry of client data would necessitate a new review step to screen errors, it would streamline the certification/eligibility process and allow the certifying staff to handle data updates as well as the elimination of inactive clients.

Placement of a remote Special Services terminal in the CTA Merchandise Mart offices could also facilitate periodic review of scheduling efficiency by Planning staff by allowing them access to the D/RTS database.

Determine feasibility of converting D/RTS software to operated on CTA's Sperry mainframe computer. CTA has available considerable computer capability on their Sperry computer which could be used for the operation and administration of the Special Services program. This larger, more powerful computer would not be affected by the CPU limitations of the Basic Four system, which currently experiences response delay problems when simul-

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\*In Section 5, Organization Structure, we have recommended reassignment of the certification function to the Scheduling Section. The recommendation above is to directly enter registrant data via a computer terminal, regardless of where this function is placed within CTA.





taneous tasks are undertaken; it would have a significantly larger memory capacity; and it would be readily accessible to departments throughout CTA which might need to access the Special Services database. Most importantly, utilization of the Sperry computer for the Special Services program would give Special Services access to CTA's Computer Operations staff, who could assist in enhancing present software capabilities or developing new support programs not covered by the D/RTS software.

Utilize training and additional programming time included in annual lease agreement. CTA's lease for the Demand/Response Transit System from September 1, 1982 through August 31, 1983 includes payment for 100 hours of training and 200 hours of programming time to provide specialized CTA functions. It is understood that the 1983-84 lease agreement was similar in its provisions.

From discussions with Special Services staff, it appears that the computer system vendor has made no attempt to maintain contact and provide support to CTA nor has CTA requested such support, particularly in the training of operating and administrative staff to use all features of the D/RTS program. We feel that a number of the data reliability and management monitoring problems identified through this study could be readily corrected by requesting the assistance which CTA is already paying for. Additionally, many of the improvements to the D/RTS software identified above are not major and could be implemented with the programming assistance included within the lease agreement with the vendor.

#### CONCLUSION

Our analysis of the computer system used by CTA's Special Services program has identified improvements to the software and to the use of the system which could result in more efficient scheduling, higher system productivity, and better management reporting. Based on discussions with staff of the Paratransit Department of the Regional Transit Authority in Cleveland, the computer software itself is capable of supporting a much larger service than CTA's and of operating at a much higher level of per-





formance: Cleveland currently uses the same software package to schedule about 1,800 trips per weekday onto a fleet of 100 vehicles using no more than 10 schedulers. We feel that CTA is not receiving nor necessarily asking for needed software support and training from the system's vendor which have been paid for in each year's lease agreement.





SECTION 3  
ESTIMATING DEMAND FOR  
SPECIAL TRANSPORTATION

OVERVIEW

The purpose of this task is to project the demand for the transportation services provided by CTA's Special Services program under status quo and several varied operating policies in the years 1984, 1988, and 1992. The projected demand figures are intended to provide guidance to CTA in decisions regarding changes to system operating policies -- specifically policies concerning eligibility and reservation practices -- and in the determination of CTA's overall accessibility policy.

At the outset of this chapter, it is critical that readers and users of the data and information contained here understand the limitations of both population data and the developed demand estimates. The gross population data used in these calculations have been obtained from primary local sources, including the Northeastern Illinois Planning Commission and the City of Chicago's Department of Planning. Because we are concerned with a subgroup of the general population, disaggregation has been done on the basis of the City's 1978 Survey of Mobility Limited Persons. These population figures are estimates and are entirely adequate for the planning purposes of this chapter.

The study reviewed a number of alternate data sources as travel needs and usage by handicapped citizens\* and determined that the Chicago study was the most reliable and appropriate basis for demand estimation. The Chicago study is unique in that it allows for detailed analysis of transit demand and present usage by severity of handicap, and, in turn, distinguishes level of handicap in terms of ability to use various forms of transportation rather than in medical or more generic categories. The

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\*Sources reviewed included the Grey Advertising study, National Survey of Transportation Handicapped People and Falcocchio et.al. Mobility of People and Goods in the Urban Environment: Mobility of the Elderly and Handicapped.



study's findings are generally in agreement with other reviewed sources, yet are much more detailed and are affected by the different travel habits and patterns present in the City of Chicago.

Demand estimates such as those presented here are frequently misunderstood and misused. Demand estimation is a planning tool which helps to size a transportation system in terms of future operating capacity or vehicle requirements. Because the demand results are based on population projections, survey response data, and, often, studies in other geographic areas, they may involve a significant inherent error and should not be acted upon without a great deal of caution.

The nature of "transit demand" is also subject to question. We have chosen to use survey-based data on people's actual travel rather than attempt to estimate the volume of travel that they would like to make. This approach avoids the overstatement problem common to survey responses concerning future desires, yet, in this case, reflects the travel rate which existed prior to implementation of the Special Services program in September 1981. Travel demand is a "moving target" which varies according to short term conditions (e.g., weather) and long term factors (e.g., the economy) and the level of demand will increase as efforts are made to satisfy it.

Within this chapter, demand estimates are developed for the years 1984, 1988, and 1992 for the current conditions of eligibility and reservation policy [Status Quo]; for a change to one-hour advance requests [Immediate Response]; and for an expanded eligibility [Expanded Eligibility]. The final portion of this chapter will examine the prospects for federal social service agency funding and the possible impacts of fund reduction on demand for Special Services transportation.

#### STATUS QUO DEMAND

The Special Services program currently serves only those City of Chicago residents who are medically-certified as being unable to utilize CTA's regular transit services. According to the results of the City's



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1978 Survey of Mobility Limited Persons<sup>1</sup> this group comprises about 65.9 percent of those citizens who are denoted as "Severely Mobility Limited."<sup>2</sup> As shown in Table 3-1, in 1984 this subgroup of the Severely Mobility Limited -- designated as Category 1 -- included an estimated total of 19,160 Chicago residents. Table 3-1 also estimates the number of Category 1 citizens in 1988 and 1992 based on a straight-line projection as a percentage of the total city population. A straight-line projection was discussed with staff of the Northeastern Illinois Planning Commission and is believed to be reasonable due to the expected constant proportion of senior citizens to the total city population through 1992.

Of the Severely Mobility Limited, 68.5 percent report that they have a regular driver available to take them where and when they wish to travel.<sup>3</sup> On the other hand, 19.6 percent indicated that they would be unable to use a door-to-door bus service with a lift or ramp if that service were provided.<sup>4</sup> Although there is undoubtedly some overlap between these two groups, by reducing the total Severely Mobility Limited estimate by these percentages, it is possible to obtain an approximation of the "Prime User Group" for the Special Services program -- that is, those individuals who are eligible for the service, do not have a readily available alternative form of transportation, and see themselves as able to make use of the program. It will be noted that the estimated Prime User Group -- 4,852 users -- is less than the total number of users presently certified to use the Special Service program (5,551 as of March 15, 1984). This is to be expected as the certified group includes individuals with an auto available who want Special Services as an alternative or backup service and other people who did not initially feel that they could use the service. For planning purposes, the Prime User Group represents a conservative estimate of the target group needing CTA's Special Services transportation on an ongoing basis.

<sup>1</sup>City of Chicago, 1978, "Report II: Demographic And Travel Characteristics in the City of Chicago."

<sup>2</sup>Ibid, p. 47.

<sup>3</sup>Ibid, p. 45.

<sup>4</sup>Ibid., p. 47.



TABLE 3-1: STATUS QUO DEMAND

	Estimated Severely Mobility Limited (0.97%)	SML Category 1 "Cannot use regular transit" (65.9%)	Reduction Factors		Prime User Group	Constrained Demand Rate (one-way trips per person per day	Estimated Weekday Constrained Trip Demand
Total City Population			(1) 65.8% of SML have auto available	(2) 19.6% of SML feel they would be unable to use svc.			
1984	2,997,455	19,160	(13,125)	(1,182)	4,852	0.32	1,553 one-way trips/day
1988	2,866,781	18,325	(12,553)	(1,131)	4,641	0.32	1,485
1992	2,853,188	18,238	(12,493)	(1,126)	4,619	0.32	1,478



The usefulness of this estimation of the system's Prime User Group lies in projecting the optimum capacity of the Special Services program and vehicle fleet size if there were no such practical constraints as funding availability. In order to compute an "optimum" capacity requirement, it is necessary to convert the number of Prime Users into a daily trip demand. The 1978 Survey provided a weekday travel rate for Severely Mobility Limited as a whole of 0.43 one-way trips per person per weekday.<sup>5</sup> This travel rate constitutes the "constrained" demand of this group, taking into account the effects of weather, transport availability, cost, scheduling of appointments, etc., on actual trip-making behavior. If we were able to satisfy this level of demand, additional "demands" would immediately surface.

Because the SML travel rates are an average trips per day for the entire group, we would expect travel rates to vary within this group according to the severity of the handicap. To approximate this variance, the average trip rate for the entire SML population (0.43 one-way trips/day) has been increased by one-half to 0.645 trips/day for the Category 2 severely mobility limited and reduced proportionately for the Category 1 SML population, to 0.32 trips/day. Applying this constrained travel rate to the Prime User estimates obtains a projected trip demand in 1984 of 1,553 one-way trips on an average weekday. According to this estimate, current services are meeting only about one-quarter of present potential demand. It should be noted that the projected demands in 1988 and 1992 decline slightly from the 1984 figure due to reductions in the total and Severely Mobility Limited populations of Chicago.

#### DEMAND UNDER IMMEDIATE-RESPONSE OPERATION

The Special Services program presently provides about one-half of its trips on a standing-order or subscription basis and the other half on a 24-hour advance reservation basis. During the 504 Transition Plan process, a goal was established to reduce the reservation requirement to a 1-hour advance notice, which would effectively provide "immediate request" service.

<sup>5</sup>Ibid., p. 44.



The best indicator of the effect of a change to immediate request service would be the experience of a similar service. Our research, though, has failed to identify any special transportation systems serving only severely mobility limited individuals which have made a transition from advance reservation to immediate request operations; almost without exception, these services are provided on advanced reservations and standing order subscriptions, most probably because of the high degree of medical and rehabilitation trips which are themselves appointments. We have identified one system serving elderly and handicapped citizens which recently changed from advanced reservation to immediate request. This system, located north of San Francisco in San Rafael, now operates eleven peak vehicles in demand responsive service. Their experience is that the service is now utilized by a much larger proportion of their client group than previously and that demand for trips increased significantly. The system is achieving up to 3 passengers per vehicle service hour during certain periods, although staff indicate that there is always more demand than can be satisfied. Because the change eliminated all advance and subscription trips, the biggest complaint concerns clients' inability to schedule medical trips until 2 hours before the desired trip time -- just like all other trips.

If the Special Services system were to change to an immediate request operation for all single-time trips, it should be expected that the current demand rate of 0.018 one-way trips per day per eligible user<sup>6</sup> will at least double to 0.036 trips per day per eligible user or more as an increased number of eligible users seek to use the service and as current users attempt to increase their trip-making habits. At this rate, the Special Services system would be receiving requests for at least 700 one-way trips on an average day where today the system receives requests for about 350 trips.

This trip rate per eligible user of 0.036 generally agrees in order of magnitude with the number of unrestricted immediate-response systems

<sup>6</sup>250 one-way single-time trips provided each weekday plus turned-down requests for an additional 100 one-way trips per day divided by 19,160 Category 1 Severely Mobility Limited citizens.



providing service for handicapped and elderly citizens -- the only systems for which good client group data was available.<sup>7</sup>

A change of the Special Service program to immediate request service would encounter two major problems. First, the change to immediate request would necessitate a complete change of the scheduling and dispatch procedure now used by the system. The current computer system is incapable of handling immediate requests in any efficient manner; the tour-sheet dispatching would be infeasible; and the present dispatch arrangement would be overwhelmed. With 32 vehicles currently in service, the scheduling and dispatch of standing order and immediate request trips would either have to be done essentially separate or the system would require at least partial computerization.

The second major problem would be a policy question, concerning continuation or elimination of standing order trips. If advance reservations are changed to immediate requests to make the service more responsive and equitably distributed, then should not the standing order services also be converted? Retention of standing orders would tend to magnify their privileged nature since all other trips would be provided on a first-come-first-served, space-available basis. Elimination of standing order trips, though, would very seriously affect the many people who depend on Special Services for daily work, school, and medical trips, and could be expected to be vigorously opposed.

If such a change to immediate request service were made, the Special Services program would also encounter a relatively common problem among demand-responsive services: excessive demand. On instituting immediate request service, initially users will follow the present practice of phoning in at 8:00 a.m. to request a trip for the next day. They will quickly learn to call on the day service is desired, and then demand will skyrocket as users try to increase their travel and new users try to enter the system. Assuming service capacity is not greatly expanded to

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<sup>7</sup>Systems for which clientele and demand rate data was reviewed included five California systems researched by the Institute of Transportation Studies, University of California, Irvine: Chico, Lodi, Paradise, Oroville, and Vallejo.



meet estimated demand (which is not recommended), short-range demand will greatly exceed the system's capacity; callers will either be turned down or will receive very long wait times (maybe 1 hour or more). Long wait times, delayed trips, and turndowns will have a negative effect on demand, eventually reducing demand to a level which the system can efficiently serve with reasonable quality.

In summary, a change of the Special Services program to immediate request service would involve major changes to current operating procedures, possible reconsideration of the system's standing order policy, and an increase in demand from the current level of 350 trips per day to about 700 trips per day. Such a change will result in releasing a significant amount of presently unmet demand for transportation, but will also increase the frustration of many users who will no longer be assured even a day in advance of a trip to obtain needed services.

#### DEMAND UNDER EXPANDED ELIGIBILITY

As explained within the discussion of demand under Status Quo conditions earlier, the Special Services program now provides transportation services to Chicago residents who cannot use CTA's regular transit services. Within the Severely Mobility Limited population, there are also those who can use regular transit service, but only with great difficulty. This group could be called "Category 2" - Severely Mobility Limited, and, according to the 1978 Survey, comprise 34.1 percent of all Severely Mobility Limited (SML) residents of the City of Chicago.<sup>8</sup> Working from the total city population and SML population estimates in Table 3-1, Table 3-2 shows a 1984 estimate of 9,915 Category 2 residents.

As discussed in the Status Quo estimate of demand, the 1978 Survey also found that 68.5 percent of the Severely Mobility Limited population had a regular vehicle and/or driver available to take them where and when they wish to travel.<sup>9</sup> If the estimated total Category 2 population is reduced by those with a driver available, the resulting figure approximates the Category 2 "Prime User Group" -- that is, residents who can now

<sup>8</sup>Ibid., p. 47.

<sup>9</sup>Ibid.; p. 45.



TABLE 3-2: DEMAND UNDER EXPANDED ELIGIBILITY

	SNL Category 2 "Can use transit with great difficulty"	Reduction Factors		Prime User Group	Constrained Demand Rate (one-way trips per person per day)	Estimated Weekday Constrained Trip Demand	Combined Weekday Demand (Category 1 & 2)
		(1) 68.5% of SNL have auto available	(2) Not Applicable				
1984	9,915	(6,792)	-	3,123	0.645	2,014	3,567
1988	9,483	(6,496)	-	2,987	0.645	1,927	3,412
1992	9,438	(6,465)	-	2,973	0.645	1,917	3,395



use regular CTA transit services but with great difficulty and who do not have a regular vehicle and/or driver available when they desire. At the present time, this Category 2 Prime User Group involves about 3,123 individuals.

Using the adjusted constrained travel demand rate of 0.645 one-way trips per person per weekday based on the 1978 Survey, the extension of Special Services privileges to Category 2 SML citizens would result in demand for 2,014 additional one-way trips per weekday in 1984. If this change were made to eligibility, the system would be faced with a total constrained demand for approximately 3,567 one-way trips per average weekday (Table 3-2). As shown in Table 3-2, the constrained demand from this group remains relatively stable through 1992, reflecting the slight decline of Chicago's total population during this period.

#### EFFECT OF REDUCED SOCIAL SERVICE FUNDING

In 1977, a survey of transportation services for elderly and handicapped residents of Chicago found 51 social service, general welfare, and specialized health agencies providing or sponsoring transportation services of some type to the elderly and handicapped.<sup>10</sup> Since that time -- and particularly since early 1981 -- the federal formula grant programs which support transportation services of this type have been significantly reduced by the present Administration.

The reduction of these funds and the subsequent fiscal difficulties of the recipient agencies raises concern among public transit providers who see an additional burden of transportation being shifted from the social service agencies to public transit. The specific question here is whether further reductions will occur in social service funding and what effects these could have on the demand for transportation services from CTA's Special Service system.

The importance of this concern is exemplified by the funding situation facing the City of Chicago's Transportation Program For Mobility-

<sup>10</sup>City of Chicago, Survey of Existing Transportation Facilities for the Elderly and Handicapped in the City of Chicago. Department of Public Works, 1977.





Limited Persons. This program, operated by the City's Department on Aging & Disability began providing specialized transportation service in the mid-1970's to individuals with mobility problems who could not use fixed-route transit services. The program has continued to provide specialized transportation despite CTA's initiation of Special Services in 1981, and currently provides about 75,000 one-way trips per year to mobility-limited city residents. Funding for this transportation program is provided predominately through two federal social service programs -- Title III of the Older Americans Act (\$300,000) and Community Development Block Grants or CDBG (\$248,000). Additional funding comes from the Regional Transportation Agency (\$200,000). Importantly, over 73 percent of the program's funds are subject to federal politics and policies on social service funding.

Significant decreases in social service funding at the federal level during the early 1980s impacted the amount of service provided by the Transportation Program For Mobility-Limited Persons at the same time that demand grew. The effect has been that allowed trip purposes have been narrowed to the point that today the service largely provides only medical trips on a single trip or short-term subscription basis. The program did provide daily commute trips for about 40 to 50 clients until May of 1983, when they were transferred to CTA's Special Services program.

Further significant decreases in funding for major social service programs serving the elderly and handicapped, such as the Older Americans Act as well as CDBG, are not seen for the immediate future according to our analysis of the federal budget through FY 1984. However, concern should be shifted to the increasing competition for the limited social service funds which are available, especially considering the "block grant" approach instituted for Title XX Social Services programs and proposed for health care programs. Should programs other than the Transportation Program For Mobility-Limited Persons be more successful in the competition for available social service funds from sources such as the Older Americans Act, the program would most probably have to cut back services -- potentially creating additional new demand for transportation from CTA's Special Services system. The ability of the program to



secure other social service funds for continuation of transportation service at the same level is limited by the fact that the Transportation Program For Mobility-Limited Persons is a single-purpose program, unlike many social service programs or agencies which provide a number of social services (health care, counseling, training, etc.) as well as transportation. For these multi-purpose service providers, transportation is recognized as the means of getting clients to the location of other agency services and not as an end in itself. Experience has shown that a cut in funding to a single-purpose, transportation-provider agency will result in direct dollar-for-dollar transportation cuts; a similar cut to a multi-purpose service provider agency will generally result in some cutbacks in transportation as well as other services but such agencies tend to be more creative and resourceful in finding new funds or "borrowing" funds from other services to continue the provision of transportation as this is the service which enables clients to get to and receive the other services.

In conclusion, major effects of reduced social service funding have been seen in the early 1980s as programs such as the City's Transportation Program For Mobility-Limited Persons had to cut back services -- often in the face of increasing demand. In 1984, the concern about social service funding should be focused more on the competition for available funds, as further significant decreases in funding amounts are not immediately planned. However, CTA's Special Services could still be affected by this situation: social service programs providing transportation to the elderly and handicapped which lose funding in the increasingly strong competition for available limited funds may have to cut back their own transportation operations -- leaving unmet demand for specialized transportation services which could impact CTA's Special Services system. The most likely source of a major increase in trip demand which is now being met by a social service or government agency is the City's Transportation Program For Mobility-Limited Persons. This program faces annual competition for its operating funds; is a single-purpose transportation program; and closely duplicates the services operated by the Special Services program.



Should this program lose funding, the potential increase in trip demand could be substantial as well as costly -- CTA's Special Services operating cost per one-way trip is more than twice the City program's cost of approximately \$10 per trip. And, importantly, this potential increase in demand is not theoretical demand as was discussed and estimated earlier in this section. The trips currently being provided by the City's program are real trips, and, should the program have to cut back its services, these trips could become real demand for CTA's Special Services.



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## SECTION 4

### CONTRACTING OPTIONS

This section reviews the issues and opportunities for contracting all or part of CTA's Special Services program. It summarizes the experience using private contractors for paratransit services of other major transit systems across the country as well as other key public agencies in the Chicago area. Contracting options are identified. These options are not necessarily a reflection of the performance of individual program elements or participants but more of a continuum of possibilities.

The decision whether or not to contract out is a critical one for the CTA as it can serve as a catalyst for other program changes. The majority of this study and report focus on recommendations which can be implemented within the existing operating scenario. To the extent the operating scheme changes, some of these recommendations may become moot and others become more critical. Therefore, in the event that the CTA chooses to pursue some form of contractual relationship for any or all of its special services program, this section concludes with a discussion of transition and implementation activities.

Finally, it is the opinion of the consultant team that contracting is a feasible option for the CTA to pursue albeit with varying degrees of implementability. This conviction guides the content of this section. It also is the reason why this section has been retitled "contracting options" rather than the original scope of services task heading of "contract feasibility".

#### 1. THE DIRECT OPERATION OF SPECIAL SERVICES CAN BE VIEWED AS A MAJOR FACTOR IN THE PROGRAM'S RELATIVELY HIGH COSTS

Labor costs typically account for two-thirds to three-quarters of a transit system's operating expenses. The 1984 budget estimate for special services parallels this rule of thumb as 70.1 percent of the budget has been allocated to scheduled transportation (STO) and other transportation (OTO):

	<u>Estimated Amount</u>	<u>Percent</u>
STO	\$ 2,261,000	56.5%
OTO	543,300	13.6
Vehicle Maintenance	1,034,100	25.9
Facility Expenses	<u>161,600</u>	<u>4.0</u>
TOTAL 1984 BUDGET	\$ 4,000,000	100.0%

In order to maximize the amount of service that the CTA receives for its annual expenditure of \$4.0 million, it is logical to focus on the largest line item of the program. For this reason, the possibility of contracting out the service, either in its entirety or in part, has been receiving considerable attention as a key cost savings opportunity.

1) The Decision to Operate the Service In-House Was Perceived as Retaining Control Over Its Quality

Staff analyses performed during the planning of special services revealed four options for operating the first 20 minibuses:

- . operate the service directly
- . lease the vehicles to a private entity and broker the service
- . provide a user-side subsidy program
- . operate the buses and also contract for service.

This analysis acknowledged that the CTA operation option would probably be more expensive and that the CTA had no operating experience with the demand-responsive mode. However, it also identified advantages of complete control over the quality of service, reliance on the CTA's known transportation and maintenance expertise and resources, and an ease of implementation given the continued involvement of CTA's unions.

Given the limited impact that the first 20 buses would make, the staff recommended a combined approach wherein CTA operated vehicles



would be supplemented by a user-side subsidy taxi program. However, this option was not acted upon by the local decision makers and the first option -- direct operation -- was implemented.

2) Though Valid in 1981, the Concerns That Prompted the Decision of Direct Operation Have Not Been Fully Substantiated

Given the local conditions which existed in 1981 as well as the limited knowledge and experience providing special services that the CTA and the transit industry as a whole had, the decision to operate the service in-house was not inappropriate. Three years later, however, significant changes have taken place and a reassessment of this decision is warranted. As other sections of this report document, the disadvantages cited during the analysis period have been realized while the advantages have not been fully exploited:

- Operating Costs Are High - Later analyses in this chapter will demonstrate how much more expensive CTA's program is on a unit cost basis compared to other major transit systems and Chicago area transportation programs.
- Experience In-house Is Limited - The experience, training and orientation of CTA personnel is in fixed-route bus and rapid rail service. The unique qualities and requirements of demand-responsive service for mobility-limited individuals were not fully understood by employees entering the program or managers outside the program.
- The Impact Has Been Minimal - Even with an expanded fleet, the number of individuals served through the program is minimal -- a frequent complaint voiced by both users and non-users of the service. Most service is concentrated along the lakefront, as projected by the staff, and not truly city-wide.
- Control Has Not Been Exercised - Though control was a primary concern, direct operation of the service by the CTA in actuality is performed with virtually no monitoring nor stipulation of performance requirements. The program is left to run itself unless a crisis warrants outside attention.

- . Expertise Has Been Demonstrated Elsewhere - The experience of other local agencies using carriers other than the CTA demonstrates that expertise and resources are available in the private sector. Though CTA's expertise may be of a different degree, it nonetheless is not exclusive in the Chicago area.

All of these conditions have prompted a reassessment of the current operating scenario for the special services program. At this point in time, it has become apparent that the cost disadvantage of direct operation has outweighed the control advantage and, in fact, control might not be lessened (maybe even heightened) in a contractual arrangement.

2. OPERATING EXPERIENCE IN CHICAGO AND ACROSS THE TRANSIT INDUSTRY SUPPORTS THE MOVEMENT TOWARDS CONTRACTING OUT PARATRANSIT SERVICES

As input to this analysis, telephone interviews were held with the managers of special services at ten major transit properties. Contact also was made with key agencies in the Chicago area regarding the capabilities of the local private sector. Both groups' experiences suggest many "lessons learned" for the CTA.

1) CTA's "Peer" Transit Systems Have Incorporated Private Contractors into their Special Services Programs with Great Success

Contact was made with virtually all of the major transit systems in the United States. A peer group of ten was identified which operated a door-to-door paratransit service for mobility-limited individuals. The peer group is identified in Exhibit 4-1.

Each was asked a series of questions regarding their use of contractors and their overall operating scenario. Annual expenditures and ridership statistics were requested also to establish order of

EXHIBIT 4-1

CTA SPECIAL SERVICES ANALYSIS  
"PEER" TRANSIT SYSTEMS

<u>City</u>	<u>Transit Agency</u>	<u>Contact</u>	<u>Telephone</u>
Baltimore	Mass Transit Administration	Ray Sparks	301/659-3535
Boston	Massachusetts Bay Transportation Authority	Tom O'Brien	617/722-5123
Cleveland	Greater Cleveland Regional Transit Authority	Rodger Sillars	216/566-5100
Dallas	Dallas Transit System	Gary Hufstедler	214/827-3400
Miami	Metropolitan Dade County Transportation Administration	Cal Marsella	305/579-2594
Milwaukee	Milwaukee County Department of Public Works	Tom Knight	414/278-4091
Minneapolis	Metropolitan Transit Commission	Bob Works (MnDOT)	612/296-2533
Philadelphia	Southeastern Pennsylvania Transportation Authority	Bob Corressel	215/575-7390
Pittsburgh	Port Authority of Allegheny County	Tom Letky	412/237-7260
Portland	Tri-County Metropolitan Transportation District of Oregon	Park Woodworth	503/238-4879

EXHIBIT 4-2

CTA SPECIAL SERVICES ANALYSIS  
PEER GROUP RANKINGS

Rank	Annual Expenditure		Monthly Ridership		Cost Per Trip	
	City	Amount (in millions)	City	Amount	City	Amount
1	Minneapolis	\$5.0	Minneapolis	36,500	Chicago	\$26.67
2	Chicago	4.0	Cleveland(b)	35,000	Philadelphia	17.26
3	Cleveland	4.0	Portland(b)	31,500	Boston	13.89
4	Philadelphia	2.9	Milwaukee	20,000	Pittsburgh(a)	11.90
5	Milwaukee	2.4	Dallas	18,500	Minneapolis	11.42
6	Dallas	2.1	Miami	14,500	Baltimore	10.53
7	Portland	2.0	Pittsburgh(a)	14,500	Milwaukee	10.00
8	Pittsburgh(a)	2.0	Philadelphia	14,000	Miami	9.77
9	Miami	1.7	Chicago	12,500	Cleveland	9.52
10	Boston	1.4	Baltimore	9,500	Dallas	9.46
11	Baltimore	1.2	Boston	9,000	Portland	5.29
	Average	\$2.6	Average	19,500	Average	\$11.11

(a) represents the transit authority's portion of the Access system, which transports 50,000 riders monthly with an annual budget of \$6.0 million.

(b) ridership includes senior citizens without serious mobility limitations

Source: Booz-Allen & Hamilton Inc., telephone survey, May 1984.

magnitude unit cost estimates and a point of comparison for CTA's special services program.

The results of this brief quantitative analysis, show:

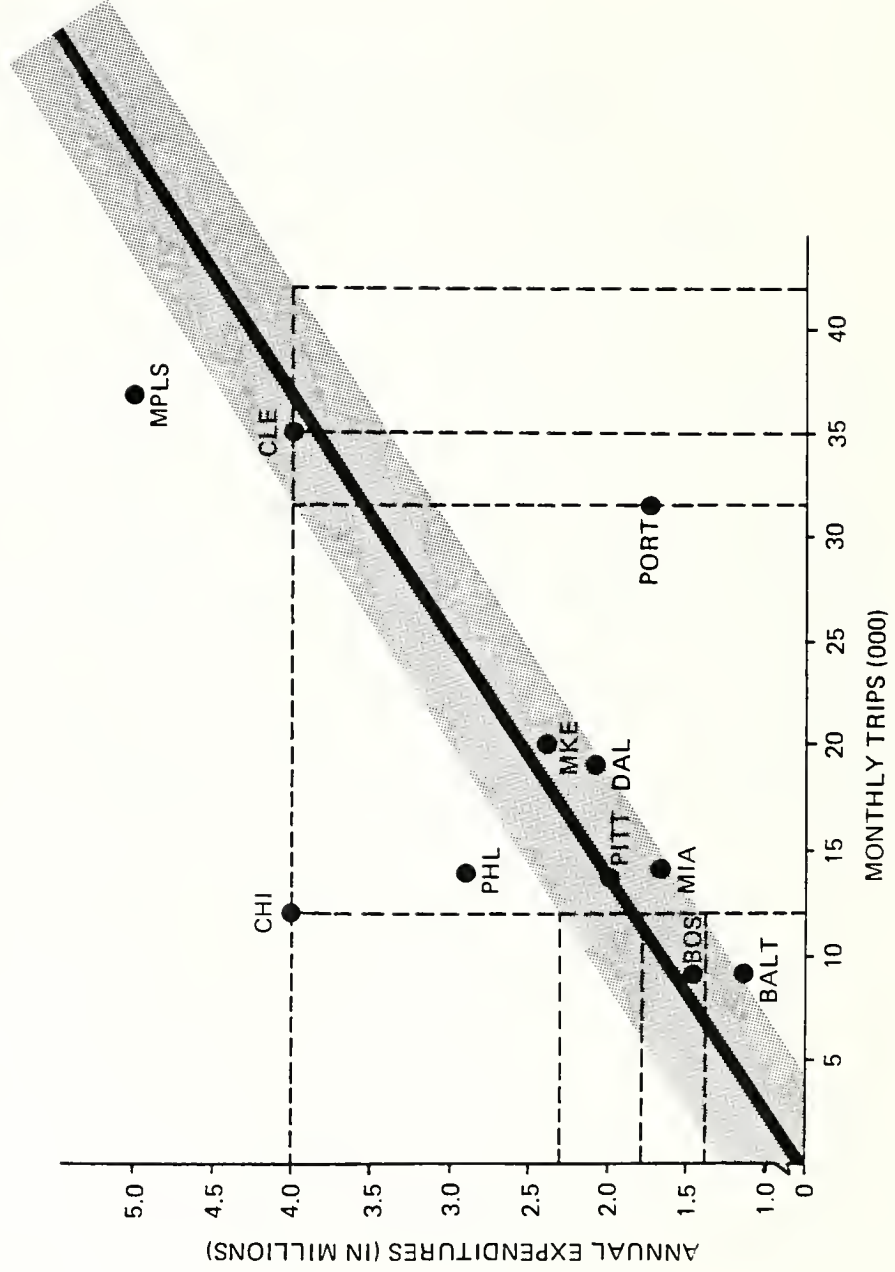
- . CTA ranks second in total expenditure at \$4.0 million.
- . CTA ranks number nine, however, in monthly ridership with less than one-third the trips of the top-ranking system.
- . Therefore, CTA has the highest cost per trip of the eleven systems, and is almost \$10 higher (55%) than the number two system.

In reviewing these figures, provided in Exhibit 4-2, it is important to recognize that there may be fundamental differences in the individual system's operations that may contribute to the variations in performance. Nonetheless, the conclusion remains that the CTA's performance (in terms of average cost per trip) is well beyond the range of industry experience. This can be further illustrated by plotting the statistics from the peer systems, the results of which follow as Exhibit 4-3. Extrapolating the CTA's annual expenditure of \$4.0 million and monthly ridership of 12,500, as shown by the dotted lines on this exhibit, suggest that the "typical" transit system could:

- . transport 12,500 monthly riders at an annual cost ranging from \$1.4 to 2.3 million, or
- . expend \$4.0 million annually and transport between 31,000 and 42,000 monthly riders.

One common factor among all of the transit systems which outperform the CTA is their reliance, all or in part, on private contractors for the provision of their special services. None rely exclusively on their own operators, as the CTA does. Specific arrangements are described below:

EXHIBIT 4 - 3  
CTA SPECIAL SERVICES ANALYSIS  
RANGE OF PEER GROUP PERFORMANCE



SOURCE: Booz - Allen & Hamilton Inc.  
TELEPHONE SURVEY, May 1984.



- Baltimore, Cleveland and Minneapolis supplement the services they operate directly with those of private contractors.
  - One cab company in Baltimore transports all individuals who do not need a lift-equipped vehicle. MTA operates 15 vans.
  - One cab company in Cleveland transports suburban users in sedans and lift-equipped vans. GCRTA operates 57 vans paying drivers 85 percent of the prevailing wage rate.
  - Six shared-ride cab companies in Minneapolis and St. Paul, one private for profit carrier and one private non-profit agency supplement MTC's fleet of 34 vehicles.
- Boston, Miami, and Portland rely on private contractors exclusively. No transit system operators are involved. Users contact the carrier directly when requesting service.
- Philadelphia and Pittsburgh each contract with a private entity to manage the operation of the program. This "broker" subcontracts with a mix of operators who can best meet travel demands. They also coordinate funding from various sources. In Philadelphia, the broker also serves as a central dispatcher of all services.
- Dallas and Milwaukee administer a user-side subsidy program. The transit system distributes riding vouchers to eligible users. The user contacts an approved carrier and arranges services directly.

Many of these systems have changed their operating style over the years. Four, for example, depended solely on their own service at first. Portland changed all of its service from direct operation to contractor provided. Baltimore, Cleveland, and Minneapolis chose to expand their service by contracting with private providers. These contracted services supplement a nucleus of their own program. The Baltimore example best illustrates the financial impact of this arrangement. Its FY 1984 budget of \$1.2 million is divided as \$1 million for the MTA's own service and \$200,000 for the cab company. Yet its monthly ridership is almost 6,000 in cabs and approximately

3,500 in their own vans. Though the systemwide cost per trip of \$10.53 is the median of the peer group, the two components of the program incur very different cost. The van cost per trip is approximately \$23.81, (close to the CTA's experience). However, cab trips cost only \$2.78 per trip. Hence, the systemwide costs are brought down considerably.

2) Other Chicago Area Agencies Have Used Private Contractors Successfully

Contact was made with two agencies in the Chicago area that are major sponsors of paratransit services in order to record their experiences and contracting caveats for the CTA. The agencies are the City of Chicago, Department on Aging and Disability and the Regional Transportation Authority. Contact also was made with the Metropolitan Transportation Association, an organization representing private providers, to obtain a general sense of the composition and capabilities of the local private transportation sector.

The City's program has been operating since 1976. During its eight years, it has changed contractors twice. The most recent change occurred last fall. Competition among two primary carriers benefitted the City in that the winning bid lowered the unit cost for the service. Currently, the contract stipulates two distinct rates -- one for individual trips and one for group trips. The individual trip cost is now \$10.20. This is almost two-thirds lower than the CTA's cost (\$26.67). Hence, the annual budget of \$750,000 (funded through Title III of the Older Americans Act, revenue sharing, and the RTA) provides approximately 6,700 monthly trips (more than half the volume CTA transports). Unlike the CTA, however, the City is able to control the program by restricting eligibility, trip purposes served, and the number of trips a person can make.

The RTA's Paratransit Program now involves 17 different services. These are provided by 16 different contractors. As Exhibit 4-4 illustrates, the contractors rely primarily on RTA-owned mini-buses or taxicabs. Only two carriers utilize their own accessible vehicles. Costs for these services range from approximately \$13 to \$21 per hour. As most are utilized by the general public, they achieve a systemwide productivity of approximately six passengers per hour. Hence, the cost per passenger trip is in a range from \$2.17 to \$3.50. Most contractors receive approximately \$50,000 to \$70,000 annually for operating a community's service. The largest contract is no greater than \$200,000.

Contract carriers also are involved in the Chicago area in the provision of medical transportation and school transportation. The former relies on several local medi-car companies funded through various public assistance and social service agency programs. The latter utilizes several local school bus companies for programs funded primarily through the Board of Education. Combined, the private carriers operate a fleet greater than 4,000 vehicles, excluding the numerous taxicabs in Chicago.

3. THE CONTRACTING OPTIONS AVAILABLE TO THE CTA ARE NUMEROUS, SPANNING ANY AND ALL FUNCTIONS OF THE SPECIAL SERVICES PROGRAM

This discussion defines aspects of the program which could be provided by a private contractor. At one extreme is the option to turn over management and operation of the entire program to a private entity. At the other is the use of contractors for a supporting subfunction of the program (e.g., scheduling and dispatching, certification of eligible users). In between is the use of private providers in the transportation function, operating all services or providing services to supplement the CTA's own operation.

EXHIBIT 4-4

CTA SPECIAL SERVICES ANALYSIS  
CONTRACTORS FOR RTA PARATRANSIT SERVICES

<u>Contractor</u>	<u>Vehicles Used</u>		
	<u>RTA Buses</u>	<u>Taxis</u>	<u>Other</u>
AB Cab Company	X	X	
American Taxi Company		X	
Auto Ride Cab Company		X	
Burks Cab Company		X	
Cook-Dupage Transportation Co.			X <sup>(a)</sup>
Courier Cab Company		X	
DAR Systems, Inc.	X		
J&B Cab Company		X	
Kammes Bus Service	X		
Magic Cab Company		X	
North Suburban Yellow Cab Co., Inc.	X	X	
Our Town Bus Company	X		
Plus, Inc. Dial-A-Bus	X		
Robinson Bus Company			X <sup>(b)</sup>
Van Der Aa Bus Lines	X		
Waukegan Yellow Cab Co.		X	

- 
- (a) accessible vans and station wagons  
(b) accessible vehicles

SOURCE: Paratransit Services: A Regional Network, Regional Transportation Authority, April 1984

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These options are described in greater detail in the discussion which follows. This is intended to serve as "thought piece" for CTA decision-makers who will resolve whether or not to pursue the contracting option in general and if so, to what extent contractors will be involved.

1) A Contract Manager Could Provide All Services

The use of a contract manager is common among small transit systems in the industry. Several firms specialize in furnishing an on-site resident manager or management team. They are supported by a headquarters staff with expertise in distinct areas -- budgeting, scheduling, marketing -- who can be called upon for special assistance should the need arise. The resident manager performs his/her responsibilities no differently than a locally-hired general manager except that he/she is an employee of the management company and not the transit system.

A contract manager would be responsible for hiring employees and assuring the delivery of service. This could be accomplished through direct operation of service or through contractual arrangements with other providers. (One "subcontractor", in fact, could be the CTA's operating unit.) In either situation, the contract manager would retain oversight for the delivery of service as well as the numerous administrative and financial functions.

2) Contractors Could Be Involved In The Transportation Function

The central activity of the special services program is the operation of the vehicles. In general, this encompasses the activities performed at Washington Garage. The alternatives to this arrangement are twofold:

- replace all CTA-provided transportation with that of private providers; or
- combine CTA direct operation of special services with services of other private providers.

In the former, the contract manager would be more akin to a service superintendent. The level and quality of service would be prescribed by the CTA. Administrative activities would be retained by the CTA. Oversight would be vested in the CTA, perhaps in a new position designated as the "Manager of Special Services".

In the latter, CTA's operation could either remain at its present level or be pared back. Contract operators could be brought in to supplement the CTA's own services. There are numerous possible configurations for dividing up the service. Five generic options are presented below:

- Riders not requiring a lift-equipped vehicle - Approximately one-half of the current special services passengers use a wheelchair or electric cart and require a lift to access the vehicle. The remainder, though they too may choose to use the lift, rely on other mobility aids such as canes, crutches and walkers. This group could travel comfortably in most any vehicle. They could be transported in another carrier's sedans or station wagons since they do not require the special equipment on CTA's buses.
- Riders travelling during specified time periods - Given the scheduling preference for subscription trips and the midday breaks scheduled in for drivers, it is not surprising that the current special services program exhibits the traditional peaking characteristics of CTA's other services. In this scenario, service would be divided among carriers according to operating time -- CTA might continue to operate peak hour service; private providers might operate the service middays, evenings, and/or weekends.



- Non-subscription riders - The current vehicle tours are built around the prescheduled subscription trips which comprise approximately one-half of the daily trips. These tours, however, are adjusted daily to try to add in other requests for service. In this scenario, all recurring trips would be scheduled together into the most efficient tours possible by CTA's experienced scheduling personnel. Adjustments would be made only on an as needed basis. All other trip requests for non-subscription service would be handled by a private carrier who would schedule and operate on an immediate response or advance-request basis.
- Immediate-Response Return Trips - Similar to the above scenario, this option involves that subset of riders who are uncertain as to when they will be ready for their return trip pick-up. In this scenario, this type of trip would be handled by a private carrier(s) who could handle immediate-response trips. Thus, a CTA vehicle would take the person to their destination but a private carrier would pick them up for the return trip.
- Emergency Back-up Service - There are occasions when traffic, weather, passenger delays, or vehicle breakdowns result in a special services vehicle falling far off schedule. In this option, the CTA would be able to call a private carrier which would dispatch a vehicle(s) immediately to "rescue" the people on-board a disabled vehicle as well as pick-up other passengers still waiting for the late vehicle. This availability of contingency service could lessen the extreme delays experienced by passengers.

The last option calls for the least amount of private sector involvement. It could be viewed as a stepping stone to other alternatives. It also could be combined with the other options -- e.g., operate all evening and weekend service and be able to support the CTA's own service should the need arise.

### 3) The Scheduling Function is a Candidate for Contracting

The scheduling function is often the "Achilles heel" of a public transit system's paratransit program. It relies on relatively new software operated by individuals unaccustomed to demand-responsive transportation. Conversely, the taxi industry has been dispatching immediate-response trips for decades, relying on manual techniques and skilled individuals. Only recently have the larger companies introduced computer-assisted techniques. The vast majority of taxi companies still rely on manual dispatching.

Given the private sector's proven expertise with the scheduling and dispatching of demand-responsive transportation (coupled with the CTA's previously-described shortcomings), it is appropriate to consider this function as a contracting option. This could occur in two distinct methods:

- . one contractor performs scheduling and dispatching for all operators in the system; or
- . each contractor is responsible for the scheduling of its own vehicles.

The first method could be performed in conjunction with a contract manager. In this regard, the contractor can be considered a "broker", matching requests for trips (demand) with available carriers (supply) in the most efficient manner. The central dispatch center would develop the vehicle tours for each carriers' vehicles. It also could have the capability to shift passengers during the operating day in the event of an emergency.

In this second arrangement, each carrier accepts requests for service directly from the users and is responsible for dispatching the service so as to meet these requests. The type of scheduling should be

pre-defined according to the carriers capabilities (e.g., immediate-response, advance reservation, or subscription) and known to the user. In this arrangement, there would be limited opportunity for carriers to back-up one another. Specific contract clauses and the professionalism of the carrier would provide the incentive for efficient and responsive performance.

4) The Certification of Eligible Users Could Be Performed Outside the CTA

The current process of eligibility certification is primarily the administrative processing of required forms. Handicapped individuals submit a doctor's certification of their mobility limitation. If all procedures are followed properly, the individual is deemed eligible and enters the client roster.

Though only a small part of the CTA's program, certification nonetheless can be considered a candidate for contracting. Several other transit systems rely on social service agencies who interact regularly with the handicapped community to perform this function. Examples include a city human services department where the caseworkers establish a person's eligibility; a United Way coordinating agency which includes this as part of its overall information and referral service; and a local Easter Seals chapter which provides a staff physical therapist who assesses the individual's extent of mobility limitation. Where a private non-profit corporation performs this service, the transit system reimburses the agency for its administrative costs. Where another public agency is involved, sometimes an interagency agreement can be enacted resulting in no transfer of public funds.

## 5) Options Extend to Vehicle Ownership

The CTA presently maintains a fleet of 42 vehicles for its special services program. In the event that it chooses to contract out all of part of the service, options regarding the use of these vehicles need to be evaluated.

First, CTA could remain the provider of vehicles. With proper legal authorization, vehicles could be leased to the contractor for their use in a CTA-sponsored service. This option could extend beyond the present 42-vehicle fleet and include replacement vehicles and possible fleet additions. The advantages of CTA taking the lead in vehicle procurement include:

- standardization - assurance that only suitable vehicles with necessary features are utilized in the service;
- visibility - continued physical evidence of the CTA's sponsorship of the program; and
- financial support - continued reliance on federal capital funds for most of the purchase price.

This arrangement would parallel that of the RTA in its purchase and leasing of paratransit vehicles to the suburban communities.

Second, the contractors could supply their own vehicles according to CTA standards. Few of the private carriers in the Chicago area have sufficient idle vehicles to immediately place into service for the CTA's program and would have to acquire additional vehicles. As the sponsor of the service, it would not be inappropriate for the CTA to stipulate specifications for the vehicles used by the contractor, particularly with respect to age, size, safety and accessibility features. Compliance audits of these vehicles would be made prior to service initiation as well as periodically on an unannounced schedule.

Third, the final option is to permit the contractor(s) to use any vehicles, provided they are properly licensed and suitable for the passengers needs (e.g., able to accommodate a user of an electric wheelchair). The actual vehicles to be used would be described in the proposal to perform as a contractor and could be used as one factor in choosing among bidders.

#### 4. THE CTA'S ROLE WOULD BE DIFFERENT IN ANY CONTRACTING SCENARIO

In the event that the CTA assumes the role of special services sponsor in addition to or instead of special services operator, it would need to assume responsibilities appropriate for its new role. This section describes three of these key activities -- setting performance requirements, monitoring service delivery, and responding to user complaints.

##### 1) Threshold Performance Levels Must Be Defined

One of the primary activities to be accomplished by the CTA in its role as service sponsor is the definition of minimum acceptable performance requirements for the system -- what the CTA expects its contractors to do. These requirements should be viewed as absolute. They can cover tangible aspects of the service (e.g., type of vehicle and number of phone lines) as well as on-street performance expectations. These would coincide with other tasks of this study and establish the minimum and target values for performance indicators such as:

- . productivity - passengers per hour
- . cost per passenger trip
- . response time (if immediate response)
- . on-time performance
- . in-vehicle ride time
- . percent of requests scheduled

These values should be established by the CTA and defined so that prospective bidders are aware of the quality of service which they are expected to maintain. Potential penalties for performance falling below the minimum threshold as well as incentives for exceeding the target values should be considered and defined at the same time. As these are innovative terms which some bidders may be unfamiliar with, care must be exercised to see that they are defined clearly and that respondents understand them explicitly. Providing sample contract clauses stipulating these requirements would enhance this.

## 2) Active Performance Monitoring Must Take Place

With the possible operation of special services activities outside the aegis of the CTA, the need for a more formal performance monitoring program will be more apparent. In its expanded role of service monitor, the CTA should establish rigid requirements for the contractors' monthly reporting procedures. Operating reports, at a minimum, should stipulate the following statistics and resulting indicators:

- . passengers transported - total and by subgroup
- . miles operated
- . hours operated
- . revenue collected
- . costs incurred
- . requests received
- . requests scheduled
- . trips cancelled

Qualitative information also should be provided on breakdowns or other in-service disruptions; complaints, commendations and suggestions received; and improvements planned or implemented. Notable trends could be highlighted, also.



The contractors should follow a reporting format developed by the CTA to assure consistency and thoroughness across all monitoring activities. To support this objective, standard instructions and definitions should be provided for the contractors to follow (defining what is included in a platform hour, for example). CTA staff should assure each carrier's understanding of the requirements as part of a pre-service "shake-down".

The CTA staff should develop a summary report monthly, tracking the performance of individual contractors as well as the program as a whole. In addition to actual month totals, it should show trends and comparisons with prior reporting periods (i.e., same month last year). Comparisons of expenditure to budget should be a key element, also.

Finally, to support its role as service monitor, the CTA should assure that appropriate information trails exist. Periodic review of a contractor's internal records should take place to assure consistency and accuracy of the reported results.

### 3) Formal Complaints Procedures Must Be Adopted

Complaints, commendations and suggestions from the users of CTA's own special services typically are handled on an informal, individual basis by Washington Garage personnel. There is no known documentation required nor standard follow-up procedures. With the possible reliance on multiple participants and "outside" participants, the CTA's role will become more of an ombudsman and overseer of service. To support this potential shift in responsibility, the CTA should establish formal procedures for receiving and responding to complaints (as well as commendations and suggestions).

One way of tracking the on-street performance of each contractor is through the comments received by the users of the service. They most likely will report infractions of the operating procedures stipulated in the contracts. These complaints should be recorded and investigated by the CTA to assure the consistency of service delivery among contractors. Formal procedures should be made known to the program's users as a demonstration of the CTA's commitment to a continued high quality of service.

5. THE TRANSITION TO A CONTRACTED SERVICE IS COMPRISED OF BOTH PARALLEL AND SEQUENTIAL STEPS

The previous discussion has identified the extent to which the CTA's role will change if it becomes the sponsor and monitor of all special services programs rather than the direct operator. This section provides a brief overview of the key activities involved in the transition and implementation of a new operating scheme.

The phase-in of contracted service means a phase-out of CTA operation. Hence, parallel efforts must be undertaken to reassign the impacted personnel (e.g., operators, superintendents, clerks and schedulers); redeploy dedicated equipment; and transfer all current files.

1) Resolve Any Outstanding Collective Bargaining Provisions

The CTA's general attorney has been requested to provide a review of appropriate agreements relevant to special services. This will serve to identify any possible constraints to contracting out any and all parts of the service as well as the possible leasing of CTA-owned special service vehicles to the contractors. Resolution of these uncertainties must be accomplished before the other activities can take

place. Therefore, this review should be expedited and necessary actions initiated as soon as the decision to pursue the contracting option is made.

## 2) Select the Preferred Contracting Option

Contracting out special services is not a single solution. It is comprised of numerous contracting options ranging from the reliance on a private contract manager to the involvement of other entities in supporting subfunctions. This chapter has described these options in general terms in order to illustrate the multiplicity of contracting options. A decision now much be reached on how much of the service will be contracted. If all, will the contract manager also handle all service requests and serve as a "broker" of services? Will individual carriers be involved or only a single carrier? Will the CTA's operating unit exist as a "subcontractor" to the contractor and still continue to provide some direct service? If parts of the program are to be contracted out, which parts? Where will the division of responsibilities be drawn?

The definition of the extent of contracting is the key decision point in the transition process. It impacts the type of activities that will follow and the magnitude of change that the existing program and procedures will undergo. This decision will enable the CTA to define the full scope of its transition activities and develop a detailed schedule for phasing-in the contractors and phasing-out the direct operation.

### 3) Initiate the Procurement Process

The procurement of contractor services will begin with the staff establishing the parameters for the contract:

- Define performance expectations - This identifies what activities a contractor will be required to perform and at what level performance will be deemed satisfactory. Input to the design of these parameters could be sought from the current users of the service under the aegis of CTA's Advisory Committee on Services for the Disabled.
- Draft contract terms - Translating these expectations and requirements into binding provisions requires the drafting of legal terms to be incorporated into the contract. A key consideration is the style of payment for a private operator. Two distinct unit costs typically are utilized.
  - Cost per trip is preferred by operators for its ease of calculation. It is to the contractor's direct financial benefit if productivity improves since actual costs are reduced but revenue from the sponsor remains constant. However, a contract term of this type also is somewhat open-ended as the total number of trips is unknown at the budget year's outset. A high success rate, measured as greater than projected ridership, may exhaust resources well ahead of the budget year.
  - Cost per hour is preferred by several transit systems. It is more exacting for budgetary purposes as it is easier to project annual service hours than annual ridership. However, it reduces a contractor's incentive to schedule trips more efficiently. Further, it involves more detailed record keeping by the contractor of a statistic that may not be maintained for other operations.

The disadvantages of either arrangement can be balanced with appropriate contract clauses requiring a certain threshold level of performance (e.g., a minimum productivity of 2.0 passengers per hour). Similarly, rates can be developed on a sliding scale basis wherein they are adjusted slightly downward if performance drops below a particular threshold or raised if it exceeds a target value.

Other related procurement activities coincide with these efforts. First, the staff should develop a list of eligible bidders. Second, screening and selection procedures should be finalized. Third, the procurement documents (request for qualifications and request for proposals) should be prepared, incorporating the parameters defined for the selected contractors performance. Other activities follow from this -- the review of qualifications statements, the review of bids, selection of contractors, and negotiation of agreements.

4) Sanction the In-House Responsibility for Special Services Monitoring

The new responsibilities for monitoring contractor performance and managing the entire special services program should be vested in one individual or a group of individuals. This staff person be designated at the same time the contracting option is selected and serve as the point of contact during the procurement process.

A prompt designation will establish this individual as the "manager of special services" in the eyes of the bidders and future contractors. It also will enable the procurement activities to proceed concurrent with any necessary organization and staffing changes.

Once the monitoring authority is in place and organizational changes are implemented, the designated staff can begin to design the actual reporting procedures to be followed. These should be finalized and presented to the selected contractors prior to contract signing as they will be needed as attachments to the legal document.

5) Prepare User Information

Working with the appropriate units within the CTA, a new brochure for users of the service should be prepared to apprise them of the imminent change and its anticipated impact. A preliminary letter to all registrants could proceed or accompany the brochure and explain that this change is a reflection of the CTA's commitment to a higher level and consistent quality of service. The brochure should be a "How-to" guide describing all operating procedures from registering, to requesting service, and riding the contractor's vehicles. The CTA's commitment to monitoring contractor performance would be enhanced by including instructions on how to contact the CTA with any comments on the service consistent with a formalized complaint procedure.

6) Conduct Shake-Down Activities

Prior to the full use of contractor services, the CTA should hold a shake-down exercise to assure that all procedures have been implemented properly. Two key features to check include:

- vehicles and related equipment - assure that any newly acquired equipment has been delivered, undergone acceptance testing and is ready for service; and
- data collection and reporting - assure that all reporting requirements are understood and that appropriate procedures exist for capturing the necessary information.

Once satisfied, the contractor should be permitted to transport passengers on a limited basis. Volunteers can be sought to use the new service first. Their reactions and those of the contractors employees will suggest any other modifications that might be required before full operation commences.



## SECTION 5

### ORGANIZATION STRUCTURE

The objective of this task is to analyze the current organizational structure of Special Services. This relates to the inner functions of the program as well as its relationship to the overall organizational structure of the CTA.

#### 1. EVERY DIVISION IN THE CTA IS INVOLVED IN THE PROVISION OF SPECIAL SERVICES

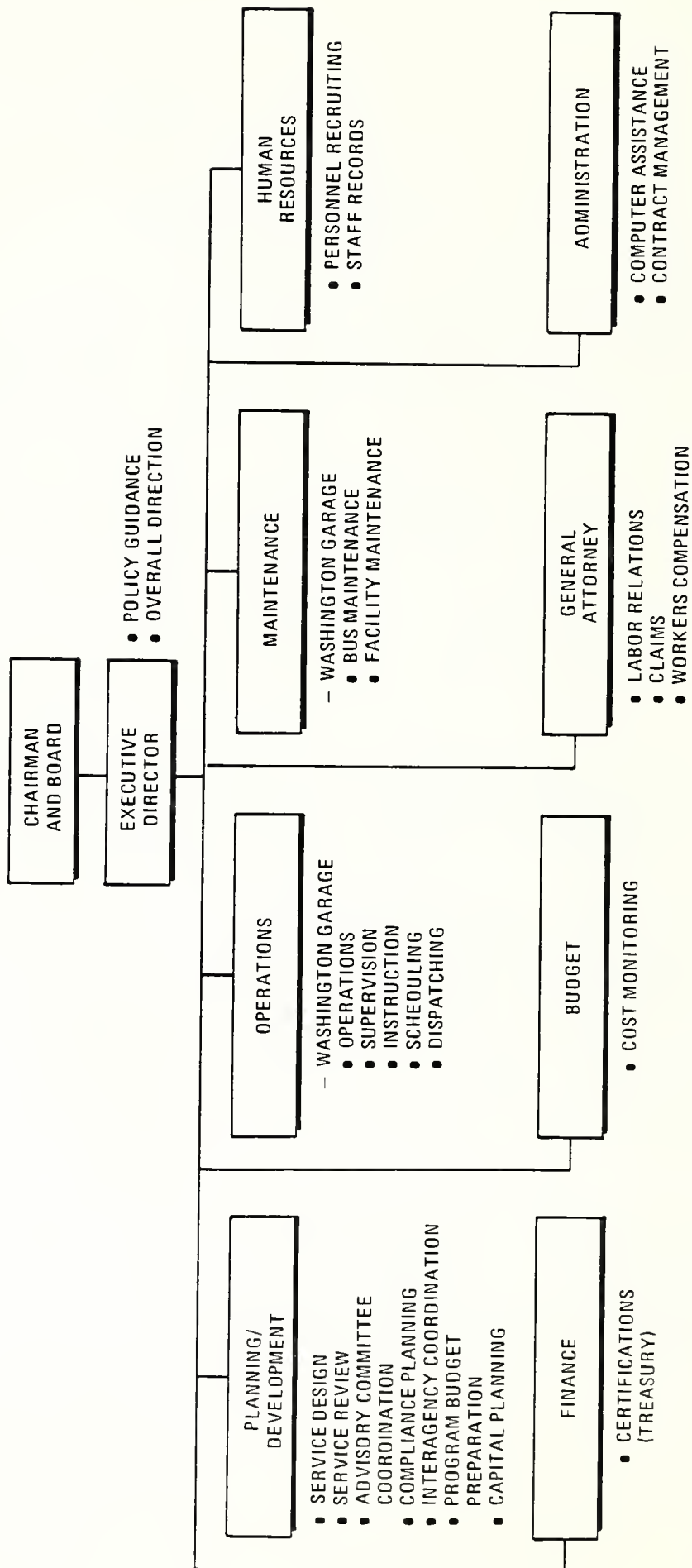
Though the level of involvement varies, the special services program draws support from the Executive Director/Board level as well as the different divisions of the organization. These division-specific responsibilities are summarized in Exhibit 5-1 and discussed below.

##### 1) The Operations And Maintenance Divisions Are Involved Through The Proceedings At Washington Garage

Washington Garage is the operations base of the special services program. The 42 vehicles used for the service are stored and maintained there. Maintenance personnel report to a unit superintendent. Their activities have been excluded from this evaluation. The operations staff of 63 people are under the auspices of the garage superintendent. These individuals perform a full range of functions, including supervision, dispatching, scheduling, and instruction. In this respect, the operations department constitutes the largest segment of the special services program.

In addition to the operations and maintenance of the special services vehicles, Washington Garage is used for automotive maintenance and is considered a support facility. Given its proximity to downtown, it also is used for midday storage of buses used for peak hour express service.

EXHIBIT 5 - 1  
CTA SPECIAL SERVICES ANALYSIS  
DISTRIBUTION OF RESPONSIBILITY FOR SPECIAL SERVICES



2) The Other Key Actors Are Within The Planning/Development And Finance Divisions

The Operations Planning Department has been responsible for all of the CTA's analyses of special needs transportation, including compliance with the current federal regulations. This department prepared the initial plan stating the need for the special services program and the service parameters. However, the department had little involvement in implementing the plan. Nor has it been directed to actively monitor day-to-day delivery of service. The department's current responsibilities include the preparation of the annual budget for the program, sponsorship and liaison with the CTA's Advisory Committee on Services for the Disabled, coordination with other agencies, preparation of driver schedules, and long-range planning for vehicles and facilities.

Another division within the CTA's organizational structure which plays a role in special services is Finance. The certification function is now housed within the Treasury; specifically, within the Group Sales Department. This section also certifies handicapped individuals for reduced fares on the fixed-route system as part of the RTA's program. The certification function has been moved throughout the organization during the life of the program. It is virtually selfcontained now, relying on only one individual.

3) Other Divisions Are Involved Less Frequently, On An As-Needed Basis

The remaining divisions within the CTA perform a supporting role to the special services program, providing their specialized skills when the need arises. Examples of the nature of this assistance are as follows:

- . Human Resources - personnel recruiting and assignment, maintenance of records;
- . General Attorney - labor relations, claims, workers compensation;

- . Administration - assistance in early computer-related issues (though no subsequent involvement occurred), management of contracts; and
- . Budget - monitoring of actual expenditures.

Finally, overall direction is provided by the Board and Executive Director. They are kept informed of service developments in order to interact effectively with the "stakeholders" of the service.

## 2. IN EACH OF THESE DIVISIONS, SPECIAL SERVICES PLAYS A SECONDARY ROLE

Special services has a low profile within the organization on a day-to-day basis. In part, this is because the CTA's primary mission is the delivery of fixed-route and rapid transit services for the general public. The orientation, therefore, of system management understandably is to this objective. Special services is an adjunct to the traditional mission and activities of the CTA.

Organizationally, special services is an adjunct to each of the divisions. In the planning division, for example, as Exhibit 5-2 illustrates, the responsibility for special services is assigned to a principal planner within Route and System Planning. This is a part-time commitment shared with the other service planning activities of the department. Other planning department staff serve in a supervisory capacity. As special issues arise, each person becomes more involved in special services, trading-off these activities with other planning efforts. The department head also has the responsibility to finalize the annual special services program budget.

This adjunctive relationship exists within the transportation function, also. Though Washington Garage is used exclusively for special services, its place within the overall operations division is remote, as Exhibit 5-3 demonstrates. Under the organization in effect at the time of this analysis, Washington Garage is one of five garages reporting to the Near South Area

EXHIBIT 5 - 2  
 CTA SPECIAL SERVICES ANALYSIS  
 LOCATION OF SPECIAL SERVICES FUNCTION  
 WITHIN THE PLANNING DIVISION

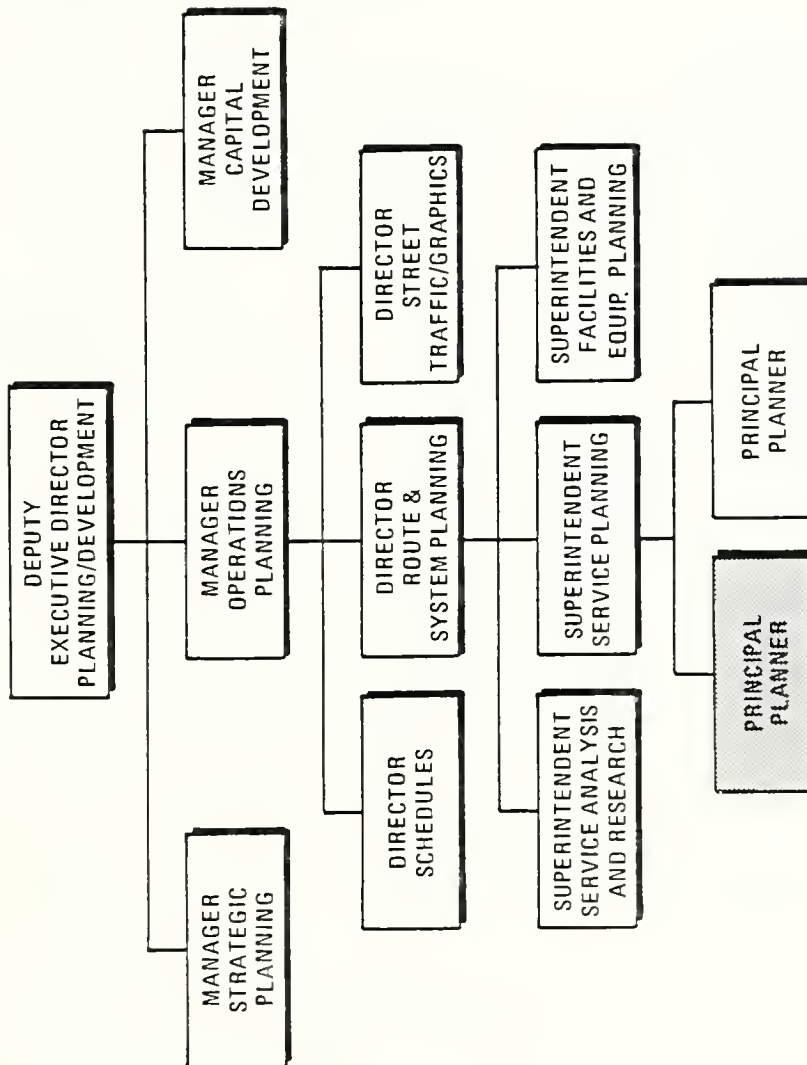
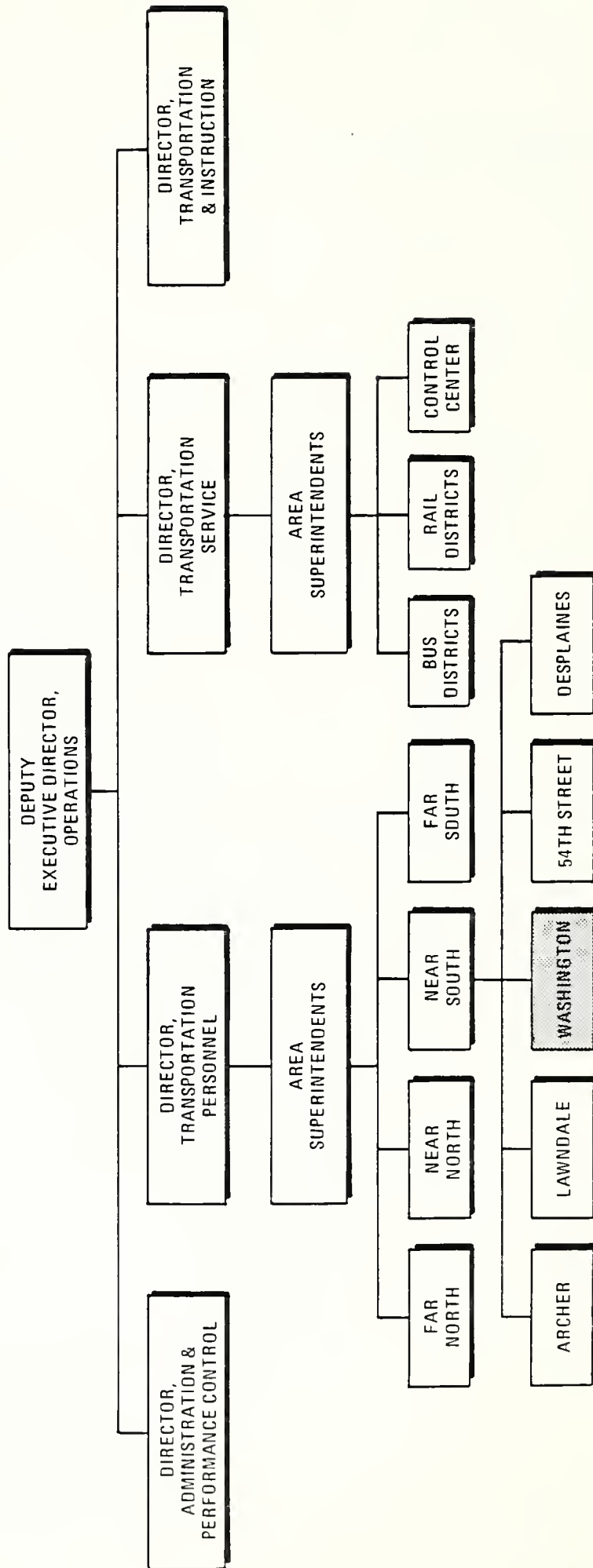


EXHIBIT 5 - 3  
CTA SPECIAL SERVICES ANALYSIS  
LOCATION OF SPECIAL SERVICES FUNCTION  
WITHIN THE OPERATIONS DIVISION



NOTE: Represents organization at time of analysis, prior to June 1984 changes within the Operations Division



Superintendent<sup>(a)</sup>. Three other Area Superintendents oversee the 15 other garages and terminals. Therefore, Washington Garage is not in the division's mainstream where the concentration is overwhelmingly on the fixed-route and rapid system.

3. THE ROLE OF SPECIAL SERVICES WITHIN THE ORGANIZATION HAS NOT BEEN DEFINED TO THE PROGRAM PARTICIPANTS

Frequent comments from various levels of the organization expressed a concern over not knowing what the CTA's policy towards special services was. Like many a small program within a large organization, there were feelings of being a "forgotten step-child." Some of the specific concerns raised include:

- . Where is this program heading?
- . Who is setting the direction for it?
- . Who is executing the policy?
- . What type of commitment do we have from top management?

In this environment, the Washington Garage personnel have taken their direction from the handicapped community. Their greatest level of accountability, therefore, has developed with the users of the service. At times, this produces a situation where the special services staff at the garage allies itself with the community (or vice versa), viewing the headquarters personnel as external.

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(a) This analysis was conducted in the Spring of 1984 and describes conditions in effect at that time. It should be noted, however, that an internal reorganization of the Operations Division took place in June 1984. Its impact on Special Services was a promotion of the Washington Garage Superintendent to Director of Special Services and the assignment of a new Superintendent from within Transportation Personnel. The Director of Special Services reports directly to the Manager, Transportation Personnel.

4. THE AUTHORITY OF ACTIVELY OVERSEEING THE PROVISION OF SPECIAL SERVICES HAS NOT BEEN GRANTED

The major participants in the special services program are the principal planner and the garage superintendent. Neither are considered as "senior" managers within the organization and do not have the authority for decision-making. This results in a situation where operations planning staff can suggest policies for the service but cannot guarantee that a policy will be implemented.

Senior managers within the two major divisions enter the process only when major issues materialize. However, at all other times, the program is left to run itself.

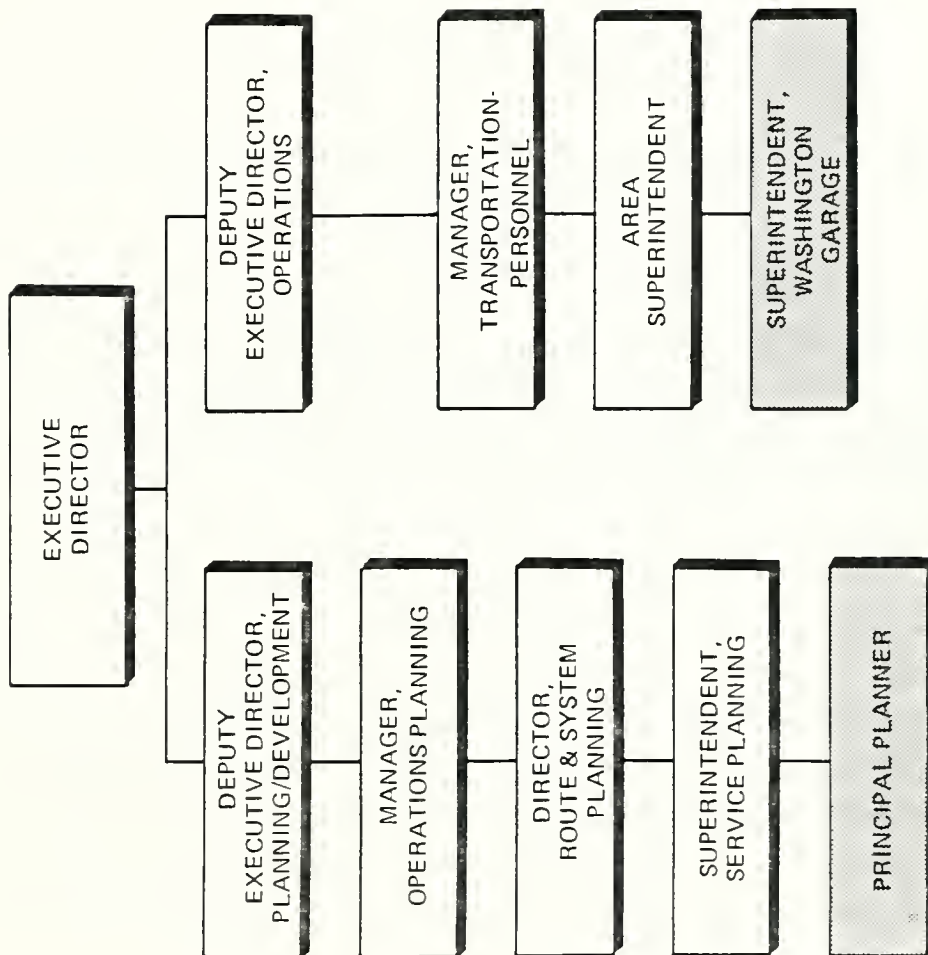
5. COMMUNICATIONS AMONG PROGRAM PARTICIPANTS FOLLOW THE EXISTING HIERARCHY

The two primary participants in the program have almost a lateral relationship within the organization, as Exhibit 5-4 illustrates. However, any formal communications among the planner and the operator of special services must be passed through the existing chain-of-command. This process of going "up, over, and down" inhibits the availability of timely information. It also may be serving to impede interaction. Given the relative weight of special services in the overall organization, the processing of requests may get less than a high priority during the channeling and get "lost in the shuffle."

6. THOUGH OPERATIONS PLANNING PERFORMS SERVICE MONITORING OF FIXED-ROUTE SERVICES, MONITORING OF SPECIAL SERVICES IS MINIMAL

Monthly information is supplied by the Washington Garage staff on passengers carried and hours operated. This is provided in memo form from the Superintendent to the Manager of Transportation. These reports do not always refer to previous month, prior year, nor year-to-date performance. Nor do they provide percentage distributions.

EXHIBIT 5 - 4  
CTA SPECIAL SERVICES ANALYSIS  
"CHAIN OF COMMAND" TO PRIMARY PROGRAM PARTICIPANTS



NOTE: Represents organization at time of analysis, prior to June 1984 changes within the Operations Division

- . Ridership and scheduling data are provided in one memo aggregated by weekday, Saturday, and Sunday. The information consists of:
  - Scheduling data
    - .. total requests for rides
    - .. total rides scheduled
    - .. total request for rides unable to be scheduled
  - Ridership data
    - .. total rides
    - .. rides by wheelchair users.

Copies of this memo also are forwarded to the executive office, operations planning, and the area superintendent.

A second monthly memo reiterates the ridership information and establishes a running total for the year. In text form, it also states the service hours operated on weekdays, Saturdays, and Sundays as well as the spread time. Copies of this report also are sent to the executive office and area superintendent (but not to operations planning).

Other ridership and service level information is made available by special request (e.g., reviews of on-time performance or tracking of "unables"). Also, the planning staff periodically calculates productivity by dividing rides by platform hour. The latter data item is available since the planning staff prepares the operator schedules for special services. The only other routine report made is the monthly report of certifications and applications. This report provides an up-to-date total in each category, a comparison from the previous month, and a geographic distribution of the total.

The on-line information maintained by the clerks and schedulers at Washington Garage with their computer system produces operating statistic summaries. The results from the daily trip history posting exercise are used to produce 12 columns of information aggregated by each run:

. Miles	. No-show
. Service Hours	. Cancels
. Passenger Total	. Lift Cancels
. Mobility Aids	. Sent Back
. Other	. Stop
. Lift	. Trips

With this information, the following performance measures can be calculated daily by run:

- . Passengers per mile
- . Passengers per hour
- . On-time performance
  - Percent early - 10, 20, 30 and 60 minutes
  - Percent late - 10, 20, 30 and 60 minutes

The accuracy of this information is dependent on the quality of data supplied by the operators. As the operations analysis has already identified, these data suffer from inconsistencies, particularly in the reporting of on-time performance. Nonetheless, this body of ridership information is readily available. However, neither these reports nor others that could be developed from this input data are generated and forwarded to the planning staff nor executive office.

Sample copies of all of the reports described are appended to the report. A review of these documents will show that they all focus on the effectiveness of the service. No cost-related information is maintained by the program participants. Hence, there is no routine tracking of expenditures nor monitoring of the program's cost efficiency.

\* \* \* \* \*

A more structured performance monitoring program is being developed in a related task of this study. It is a logical extension of current planning activities that these monitoring efforts are being assumed by the Planning

Division, in particular the Operations Planning Department. Participation in these expanded monitoring activities as well as oversight for implementing the recommendations of this study will bring the involvement of the planning staff up to a full-time commitment.

With this expanded set of activities, the need for a related realignment of the headquarters staff involved in special services becomes apparent. To this end, two specific recommendations regarding the organization structure are made.

#### 7. CREATE A DISTINCT SPECIAL SERVICES FUNCTION

The management of the \$4 million special services program should receive the undivided attention of at least one management person at CTA's headquarters supported by a paraprofessional to provide clerical assistance (e.g., taking minutes, typing, filing, etc.). It is recommended that the function of "Special Services Coordination" be established and delegated the authority to assure that stated policies are implemented and that operating performance is satisfactory.

There are several organizational options available for the location of this new function. Other transit systems show no uniformity in where they have assigned this responsibility. Though planning and operations divisions are common "homes" (e.g., Baltimore, Cleveland, Dallas and Portland), other systems' special service functions exist in separate units reporting directly to the Executive Director in others (e.g., Boston, Miami and Pittsburgh). The options suggested for the CTA are:

- . within the Route & System Planning section, as it now is; or
- . as a separate operations planning section (on a par with route and system planning, for example); or
- . as a separate department.



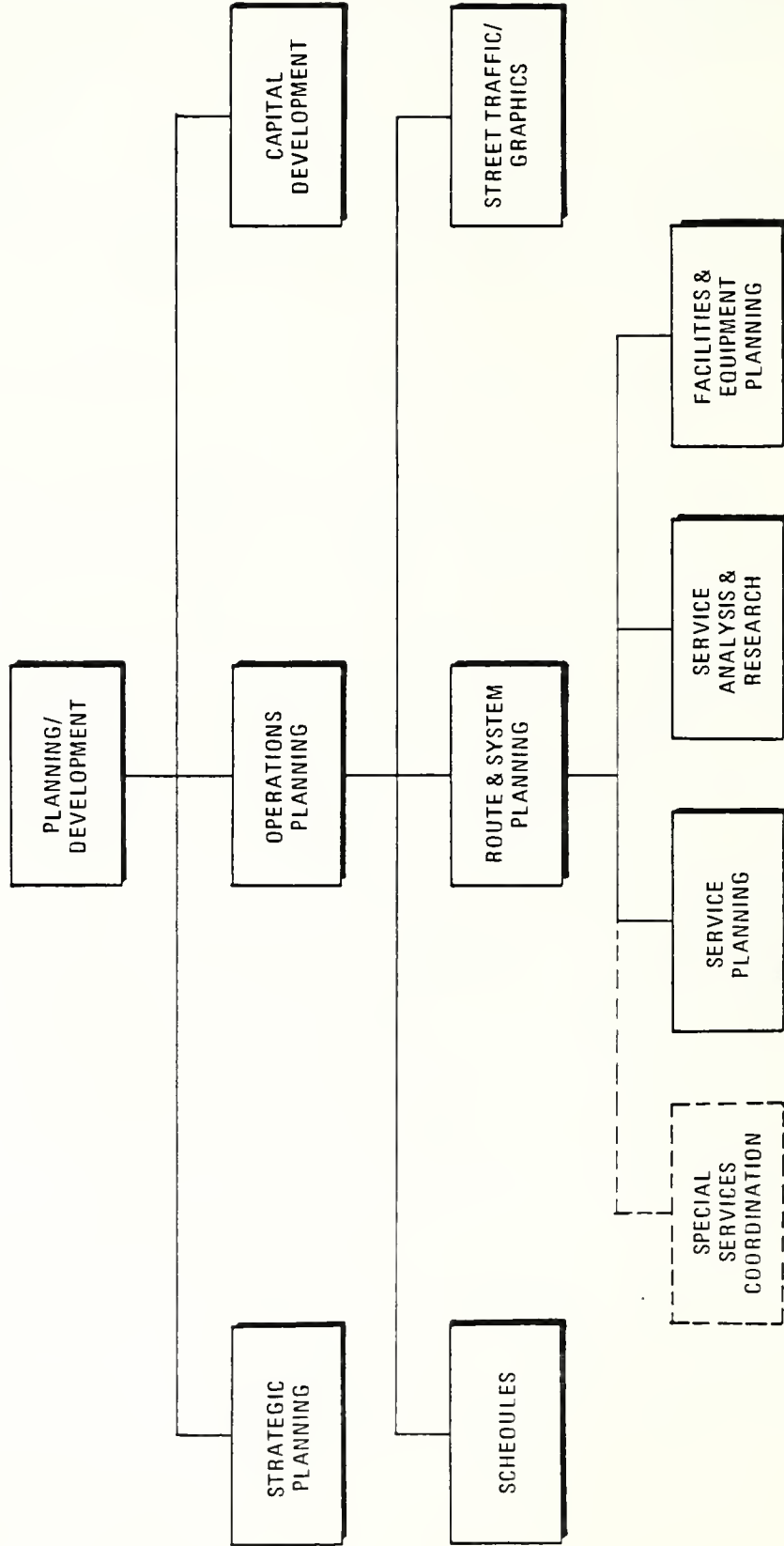
The first option is recommended. As shown in Exhibit 5-5, the new function "Special Services Coordination" should be established at the superintendent level. A comparison with the existing organization within the planning division (Exhibit 5-2) will show this to be an advancement of one level. This alternative offers an appropriate degree of recognition for the special services program within the perspective of the CTA's overall mission of transporting both the able-bodied and mobility-impaired residents of Chicago. The primary responsibility of this section would be to:

- implement a service monitoring program for the operating unit to follow;
- prepare a monthly report highlighting service trends and accomplishments for the executive director and board; and
- track the status of recommendations from this study regarding improvements to the existing program.

Establishing a central focus within the CTA for special services should lead to a central point for coordinating all services for the disabled. Hence, the unit also should become involved in other programs, in particular those efforts now underway to make the mainline service accessible by the construction of lifts and other features at rapid rail stations. This is particularly compatible with the current organization of Route & System Planning, where the work unit "Facilities & Equipment Planning" is located. Facilities & Equipment Planning is responsible for preliminary station planning and equipment, i.e., accessible car and bus planning. On equal levels in the same work unit, coordination will be enhanced. Finally, this single point of contact not only can assure that the various programs are coordinated, it also can better document and publicize the CTA's accomplishments in serving the disabled community.

The primary responsibilities of this unit will be service monitoring and coordination. In the event that the CTA decides to change the method in which it operates service and involve private contractors, its primary responsibilities will remain as service monitoring and coordination. Though the magnitude

EXHIBIT 5 - 5  
CTA SPECIAL SERVICES ANALYSIS  
PROPOSED ORGANIZATIONAL REALIGNMENT



of monitoring may exceed the time available of one person, the function itself and its organizational alignment would remain unchanged. In this respect, this recommendation is appropriate for any operating scenario and should be implemented as one of the first responses to this study.

#### 8. REASSIGN THE CERTIFICATION FUNCTION TO THE SCHEDULING SECTION

The certification process is hindered by its lack of automated client files; the scheduling/dispatching process does not have immediate access to registration files in order to verify eligibility. Both constraints could be alleviated by physically moving the certifier to the Washington Garage and providing him access to the computer system. This would streamline the certification process and its extensive though somewhat duplicative client files. It also could expedite the process by shortening the time between approval of the application and ability to begin requesting service. Coordinating these procedures also would enable the CTA to establish certification checks on users and verify continued eligibility as all information would be in one place.

APPENDIX  
SAMPLE MONITORING REPORTS

# Chicago Transit Authority

FEB. 1, 1984

To: MANAGER TRANSPORTATION

From: SUPT. WASHINGTON GARAGE

Re: TOTAL REQUEST FOR RIDES IN JANUARY (1984)  
TOTAL RIDES SCHEDULED  
TOTAL REQUEST FOR RIDES WE COULD NOT SCHEDULE (UNABLES)

## SCHEDULING DATA FOR JANUARY 1984

SUNDAYS.....	TOTAL REQUEST	577
	UNABLES	81
	SCHEDULED	496
SATURDAYS.....	TOTAL REQUEST	318
	UNABLES	45
	SCHEDULED	273
WEEKDAYS.....	TOTAL REQUEST	4,373
	UNABLES	699
	SCHEDULED	3,674

## TOTAL RIDERSHIP FOR THE MONTH OF JANUARY

SUNDAYS.....	TOTAL RIDES	1,576	W/C =	493
SATURDAYS.....	TOTAL RIDES	816	W/C =	227
WEEKDAYS.....	TOTAL RIDES	9,106	W/C =	3,731
	TOTAL	11,498	W/C =	4,451



ISAAC S. BEAL  
SUPERINTENDENT  
SPECIAL SERVICES  
WASHINGTON GARAGE

cc: MR. J.R. BLANK  
OPERATIONS PLANNING  
NEAR SOUTH AREA SUPT.

# Chicago Transit Authority

FEB. 1, 1984

To: MANAGER TRANSPORTATION

From: SUPT. WASHINGTON GARAGE

Re: SERVICE HOURS AND AVERAGE NUMBER OF  
PASSENGERS TRANSPORTED PER MONTH

JANUARY 1, 1984 thru JANUARY 31, 1984

During this period we transported a total of 11,498 passengers; 4,451 were wheelchairs bound. We were available for service 1,309.5 hours per week (Weekdays), 261.9 hours per week day, 112.0 hours on Saturdays and 112.0 hours on Sundays and Holidays.

Our spread time was 9.9 hours per weekday and none on Saturdays, Sundays and Holidays.

Total number of passengers carried per month to date for 1984:

January	1984	11,498 passengers	4,451 wheelchairs
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ISAAC S. BEAL  
SUPERINTENDENT  
SPECIAL SERVICES  
WASHINGTON GARAGE

cc: MR. J.R. BLAA  
NEAR SOUTH AREA SUPT.



# Chicago Transit Authority

JAN. 3, 1984

To: MANAGER TRANSPORTAT

From: SUPT. WASHINGTON GARAGE

Re: SERVICE HOURS AND AVERAGE NUMBER OF  
PASSENGERS TRANSPORTED PER MONTH

DECEMBER 1, 1983 thru DECEMBER 31, 1983

During this period we transported a total of 11,398 passengers; 4,601 were wheelchair bound. We were available for service 1,309.5 hours per week (Week-days), 261.9 hours per weekday, 112.0 hours on Saturdays and 112.0 hours on Sundays and Holidays.

Our spread time was 9.9 hours per weekday and none on Saturdays, Sundays and Holidays.

Total number of passengers carried per month to date for 1983:

January	1983	8,182 passengers	2,859 wheelchairs
February	1983	7,962 passengers	2,860 wheelchairs
March	1983	9,184 passengers	3,602 wheelchairs
April	1983	8,856 passengers	3,356 wheelchairs
May	1983	9,823 passengers	3,915 wheelchairs
June	1983	10,521 passengers	4,289 wheelchairs
July	1983	10,651 passengers	4,254 wheelchairs
August	1983	11,143 passengers	4,513 wheelchairs
September	1983	11,336 passengers	4,632 wheelchairs
October	1983	11,830 passengers	4,803 wheelchairs
November	1983	11,313 passengers	4,872 wheelchairs
December	1983	11,398 passengers	4,601 wheelchairs

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TOTAL RIDES	1983	122,199 PASSENGERS	48,576 WHEELCHAIRS
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ISAAC S. BEAL  
SUPERINTENDENT  
SPECIAL SERVICES  
WASHINGTON GARAGE

cc: MR. J.R. BLAA  
NEAR SOUTH AREA SUPT.

# Chicago Transit Authority

February 22, 1984

To: Glenn J. Schofield

From: Earl V. Boyd *E. B.*

Re: Access Transportation

As of February 22, 1984, a total of 6,591 applications have been received: 5,454 (83%) have been certified, 1,073 (16%) are pending and will be certified upon receipt of missing information and 64 (1%) are ineligible based on the eligibility criteria. To date, 31 Spanish language applicants have been received and are included in the total of 5,454 certified applicants, 44% are in wheel chairs and 56% are ambulatory.

The following table shows the geographic distribution, by percentage, of the applications requested as compared to those certified.

Geographic Area	ESTIMATED PERCENTAGE OF APPLICATIONS		PERCENTAGE OF CERTIFICATIONS	
	Last Report Date: 01-24-84	Present Report Date: 02-17-84	Last Report Date: 01-24-84	Present Report Date: 02-17-84
Downtown	24%	23%	5%	4%
North	18%	18%	28%	27%
Northwest	6%	6%	8%	8%
West	15%	15%	8%	9%
Southeast	14%	14%	22%	22%
South	12%	13%	21%	21%
Southwest	9%	9%	8%	9%
Suburb	2%	2%	0	0
TOTAL	100%	100%	100%	100%

At this point, a breakdown of the 64 ineligible applicants is as follows:

Visually Impaired:	31
Hearing Impaired:	--
Mentally Retarded:	16
Out Of Service Area:	10
Other:	7

EVB:mtg

Cc: W. Baxa  
I. Beal  
D. Perk  
J. Roth

AREA & RUN	MILES	SVC HRS	TOTAL	AIDS	OTHER	LIFT	NO SHOW	CANCELS	CANCELS	BACK	STOPS	TRIPS
A56	120	6 9	11	6	0	3	0	2	0	0	22	11
A57	53	5 7	7	4	0	3	0	3	0	0	14	7
A58	79	7 3	12	7	0	2	0	2	0	0	20	10
A59	95	6 9	16	5	0	6	0	3	0	0	28	14
A60	78	6 4	6	3	0	3	0	7	0	0	12	6
A61	67	6 5	10	6	0	4	0	4	0	0	20	10
A62	121	7 2	16	6	0	4	0	7	0	0	26	13
A63	62	6 8	10	6	0	4	0	2	0	0	20	10
A64	88	6 8	13	1	0	11	0	2	0	0	26	13
A65	73	5 1	8	2	0	5	0	1	0	0	16	8
A66	38	7 1	5	1	0	3	0	1	0	0	10	5
A67	120	6 3	11	3	0	6	0	4	0	0	18	9
A68	13	7 1	12	0	0	1	0	0	0	0	2	1
A69	88	13 1	10	0	0	6	0	8	0	0	20	10
A70	110	6 9	13	3	1	4	0	4	0	0	20	10
A71	93	7 9	16	4	0	8	0	2	0	0	26	13
A72	80	3 2	15	3	0	6	0	1	0	0	22	11
A73	16	1 1	1	0	0	1	0	0	0	0	2	1
A74	54	2 4	5	4	0	1	0	0	0	0	10	5
A75	65	5 5	20	4	0	9	0	0	0	0	26	13
A76	19	1 3	2	4	0	1	0	0	0	0	10	5
A77	35	3 3	9	3	0	2	0	3	0	0	26	13
A78	46	2 7	6	4	0	4	0	1	0	0	4	2
A79	56	2 9	7	2	0	4	0	0	0	0	12	6
A80	41	2 8	9	4	0	4	0	2	0	0	12	6
A81	61	3 3	9	4	0	4	0	2	0	0	12	6
A82	41	2 3	4	0	0	7	0	1	0	0	16	8
A83	74	2 7	8	3	0	2	0	1	0	0	14	7
A84	51	2 1	4	2	0	3	0	0	0	0	8	4
A85	6	2 3	5	2	0	2	0	0	0	0	14	7
A86	86	7 1	12	5	0	3	0	1	0	0	18	9
A87	89	7 3	11	5	0	5	0	0	0	0	10	5
A88	82	7 0	12	5	0	5	0	3	0	0	20	10
A89	82	6 1	11	3	0	6	0	2	0	0	20	10
A90	97	7 0	11	3	0	7	0	5	0	0	22	11
A91	61	6 3	13	2	0	4	0	2	0	0	22	11
A92	107	6 8	14	9	1	5	0	4	0	0	14	7
A93	75	6 9	13	4	0	4	0	2	0	0	20	10
A94	117	6 7	15	9	0	4	0	2	0	0	20	10
A95	74	6 7	26	6	0	5	0	3	0	0	26	13
A96	75	7 2	17	0	0	11	0	1	0	0	34	17
AREA A TOTAL	2,888	226 5	422	142	2	194	1	98	55	0	720	360
B72	40	1 0	2	0	0	1	0	0	0	0	4	2
B74	64	3 0	7	3	0	2	0	2	0	0	10	5
B76	50	3 3	9	3	0	4	0	1	0	0	14	7
B77	51	3 1	7	2	0	4	0	2	0	0	12	6
B78	53	3 9	7	1	0	5	0	2	0	0	14	7
B79	13	2 6	0	0	0	0	0	3	0	0	0	0
B80	45	3 4	5	3	0	0	0	2	0	0	10	5
B81	42	2 2	4	1	0	3	0	2	0	0	8	4
B82	14	2 5	3	0	0	3	0	2	0	0	4	2
B83	53	2 9	7	3	0	4	0	4	0	0	14	7

CHICAGO TRANSIT AUTHORITY  
PASSENGER PERFORMANCE

1 2 8 6 1  
02/06/84

FOR  
01/19/84  
SENT

PAGE 2

LIFT

AREA & RUN

MILES

SVC HRS

PASSENGER  
TOTAL

MOBILITY  
AIDS

OTHER

LIFT

NO SHOW

CANCELS

CANCELS

BACK

STOPS

TRIPS

4-0001  
02/06/84

1102

AREA & RUN	MILES	SVC HRS	PASSENGER TOTAL	MOBILITY AIDS	OTHER	LIFT	NO SHOW	CANCELS	LIFT CANCELS	01/19/B4 SENT BACK	STOPS	TRIPS	PAGE 2
B84	56	3 6	9	5	0	3	0	0	0	0	18	9	
B85	60	2 9	7	4	0	2	0	1	1	0	14	7	
AREA B TOTAL	541	34 5	67	25	0	32	0	19	15	0	124	62	
S58	43	2 1	3	2	0	1	0	0	0	0	6	3	
S61	18	0 5	1	0	0	1	0	0	0	0	2	1	
S66	40	2 8	3	0	0	3	0	0	0	0	6	3	
S68	74	4 0	6	3	0	2	0	0	0	0	10	5	
S73	72	6 1	6	1	0	4	0	0	0	0	12	6	
S76	19	2 3	4	2	0	2	0	0	0	0	8	4	
S78	0	0 0	0	0	0	0	0	0	0	0	0	0	
S79	0	0 0	0	0	0	0	0	0	0	0	0	0	
S82	11	0 2	1	0	0	1	0	0	0	0	2	1	
AREA S TOTAL	277	17 9	24	8	0	14	0	0	0	0	46	23	
T78	13	1 8	2	1	0	1	0	0	0	0	4	2	
T79	53	3 4	3	0	0	3	0	0	0	0	6	3	
AREA T TOTAL	66	5 3	5	1	0	4	0	0	0	0	10	5	
W99	0	0 0	0	0	0	0	0	3	2	0	0	0	
AREA W TOTAL	0	0 0	0	0	0	0	0	3	2	0	0	0	
FINAL TOTALS	3,772	284 2	518	176	2	244	1	120	72	0	900	450	

1 2 8 6 2  
02/06/84

CHICAGO TRANSIT AUTHORITY  
QUALITY OF SERVICE

AREA & RUN	PASSENGERS PER MILE		PASSENGERS PER HOUR		EARLY	
	60 MIN	30 MIN	60 MIN	30 MIN	30 MIN	10 MIN
1	10	20	10	20	10	20
2	10	20	10	20	10	20
3	10	20	10	20	10	20
4	10	20	10	20	10	20
5	10	20	10	20	10	20
6	10	20	10	20	10	20
7	10	20	10	20	10	20
8	10	20	10	20	10	20
9	10	20	10	20	10	20
10	10	20	10	20	10	20
11	10	20	10	20	10	20
12	10	20	10	20	10	20
13	10	20	10	20	10	20
14	10	20	10	20	10	20
15	10	20	10	20	10	20
16	10	20	10	20	10	20
17	10	20	10	20	10	20
18	10	20	10	20	10	20
19	10	20	10	20	10	20
20	10	20	10	20	10	20
21	10	20	10	20	10	20
22	10	20	10	20	10	20
23	10	20	10	20	10	20
24	10	20	10	20	10	20
25	10	20	10	20	10	20
26	10	20	10	20	10	20
27	10	20	10	20	10	20
28	10	20	10	20	10	20
29	10	20	10	20	10	20
30	10	20	10	20	10	20
31	10	20	10	20	10	20
32	10	20	10	20	10	20
33	10	20	10	20	10	20
34	10	20	10	20	10	20
35	10	20	10	20	10	20
36	10	20	10	20	10	20
37	10	20	10	20	10	20
38	10	20	10	20	10	20
39	10	20	10	20	10	20
40	10	20	10	20	10	20
41	10	20	10	20	10	20
42	10	20	10	20	10	20
43	10	20	10	20	10	20
44	10	20	10	20	10	20
45	10	20	10	20	10	20
46	10	20	10	20	10	20
47	10	20	10	20	10	20
48	10	20	10	20	10	20
49	10	20	10	20	10	20
50	10	20	10	20	10	20
51	10	20	10	20	10	20
52	10	20	10	20	10	20
53	10	20	10	20	10	20
54	10	20	10	20	10	20
55	10	20	10	20	10	20
56	10	20	10	20	10	20
57	10	20	10	20	10	20
58	10	20	10	20	10	20
59	10	20	10	20	10	20
60	10	20	10	20	10	20
61	10	20	10	20	10	20
62	10	20	10	20	10	20
63	10	20	10	20	10	20

FOR  
01/19/84  
-----+

AREA & RUN	PER MILE	PER HOUR	60 MIN	30 MIN	20 MIN	10 MIN	10 MIN	20 MIN	30 MIN	60 MIN
A56	0 1	1 6	0 0	9 1	0 0	0 0	0 0	0 0	0 0	0 0
A57	0 1	1 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A58	0 2	1 7	0 0	0 0	0 0	10 0	0 0	0 0	0 0	0 0
A59	0 2	2 3	0 0	0 0	0 0	28 6	3 6	0 0	0 0	0 0
A60	0 1	0 9	0 0	0 0	0 0	25 0	8 3	0 0	0 0	0 0
A61	0 2	1 5	0 0	0 0	0 0	25 0	10 0	0 0	5 0	0 0
A62	0 1	2 2	7 7	0 0	0 0	0 0	26 9	0 0	0 0	0 0
A63	0 2	1 5	0 0	5 0	0 0	0 0	15 0	0 0	0 0	0 0
A64	0 2	1 9	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A65	0 1	1 6	0 0	0 0	0 0	0 0	6 3	0 0	0 0	0 0
A66	0 1	0 7	0 0	0 0	0 0	10 0	0 0	20 0	0 0	0 0
A67	0 1	1 8	5 6	0 0	0 0	11 1	0 0	0 0	0 0	0 0
A68	0 2	0 3	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A69	0 1	0 8	5 0	0 0	0 0	15 0	0 0	20 0	5 0	0 0
A70	0 1	1 9	0 0	0 0	0 0	45 0	0 0	40 0	0 0	0 0
A71	0 2	2 0	0 0	0 0	0 0	15 4	0 0	3 9	34 6	3 9
A72	0 2	4 6	0 0	0 0	0 0	9 1	0 0	0 0	0 0	0 0
A73	0 1	0 9	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A74	0 1	2 1	0 0	0 0	0 0	30 0	0 0	0 0	0 0	0 0
A75	0 3	3 6	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A76	0 1	1 5	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A77	0 3	2 8	0 0	0 0	0 0	16 7	0 0	0 0	0 0	0 0
A78	0 1	2 3	0 0	0 0	0 0	33 3	16 7	41 7	0 0	0 0
A79	0 1	2 4	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A80	0 2	3 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A81	0 2	2 7	0 0	0 0	0 0	35 7	37 5	21 4	0 0	0 0
A82	0 1	1 8	0 0	0 0	0 0	25 0	0 0	0 0	0 0	0 0
A83	0 1	3 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A84	0 1	1 9	0 0	0 0	0 0	37 5	12 5	0 0	0 0	0 0
A85	0 1	2 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A86	0 1	1 7	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A87	0 1	1 5	0 0	15 0	0 0	0 0	5 0	0 0	0 0	15 0
A88	0 2	1 7	0 0	0 0	0 0	13 6	0 0	0 0	0 0	0 0
A89	0 1	1 8	0 0	0 0	0 0	31 8	0 0	0 0	0 0	0 0
A90	0 1	1 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A91	0 2	2 1	5 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A92	0 1	2 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
A93	0 2	1 9	0 0	0 0	0 0	40 0	0 0	0 0	0 0	0 0
A94	0 1	2 2	0 0	7 7	0 0	15 4	0 0	3 9	0 0	0 0
A95	0 4	3 9	0 0	0 0	0 0	18 2	40 9	9 1	0 0	0 0
A96	0 2	2 4	0 0	0 0	0 0	17 7	11 8	2 9	0 0	0 0
AREA A TOTAL	0 2	1 9	0 7	2 1	1 4	11 7	6 7	3 9	0 6	0 6
B72	0 1	2 1	0 0	25 0	0 0	25 0	0 0	0 0	0 0	0 0
B74	0 1	2 3	0 0	0 0	0 0	10 0	0 0	0 0	0 0	0 0
B76	0 2	2 7	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
B77	0 1	2 3	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
B78	0 1	1 8	0 0	0 0	0 0	0 0	0 0	7 1	0 0	0 0
B79	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
B80	0 1	1 3	0 0	10 0	10 0	0 0	20 0	20 0	0 0	0 0
B81	0 1	1 8	0 0	0 0	0 0	50 0	0 0	0 0	0 0	0 0
B82	0 2	1 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
B83	0 1	2 4	0 0	0 0	0 0	0 0	0 0	33 3	0 0	0 0

02/06/84

QUALITY OF SERVICE

PAGE 2

AREA & RUN	PASSENGERS PER MILE	PASSENGERS PER HOUR	EARLY				LATE				FOR 01/19/84	
			60 MIN	30 MIN	20 MIN	10 MIN	10 MIN	20 MIN	30 MIN	60 MIN		
B84	0.2	2.5	0.0	0.0	0.0	3.6	16.7	5.6	11.1	0.0		
B85	0.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
AREA B TOTAL	0.1	1.9	0.0	1.6	0.8	2.4	7.3	3.2	4.0	1.6		
S58	0.1	1.4	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0		
S61	0.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
S66	0.1	1.1	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0		
S68	0.1	1.5	0.0	20.0	10.0	0.0	0.0	0.0	0.0	0.0		
S73	0.1	1.0	0.0	8.3	0.0	0.0	8.3	8.3	0.0	0.0		
S76	0.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
S78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
S79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
S82	0.1	4.6	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0		
AREA S TOTAL	0.1	1.3	0.0	6.4	2.1	4.3	2.1	10.7	4.3	0.0		
T78	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0		
T79	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	66.7	16.7		
AREA T TOTAL	0.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	41.2	16.5		
W99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
AREA W TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
FINAL TOTALS	0.1	1.8	0.6	2.2	1.3	4.1	10.4	6.3	4.4	0.9		



SECTION 6  
VEHICLES AND FACILITIES

This section contains two analyses of Special Services' vehicle requirements and the potential for remote vehicle placement. The first subsection examines the size and physical characteristics needed by Special Services to provide its services and estimates the number of vehicles needed to meet projected present and future levels of transit demand, which were determined within Section 3 of this report. The second subsection addresses the strategy of operating some portion of the Special Services fleet from other than Washington Garage in order to reduce dead-head travel and non-productive operator hours.



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## A. VEHICLE ANALYSIS

### OVERVIEW

Two separate tasks within this analysis of Special Services address the vehicle requirements of the program: Task 3.5 examines the size of the vehicles used by CTA and identifies the factors leading to vehicle selection by the CTA, and Task 6.1 estimates the replacement needs of CTA based on projected useful life of the current fleet and expanded fleet needs in accordance with demand projections made in Section 3 of this report.

### CURRENT CTA SPECIAL SERVICES FLEET

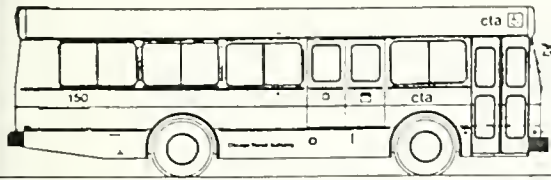
Special Services presently operates a total fleet of 42 vehicles, as detailed in Exhibit 6-1. Of these vehicles, only about 30 are in service at the system's peak period, leaving about 12 vehicles either standing by or involved in regular and periodic maintenance. This constitutes a spare ratio of about 40%, which is higher than typically found in special transportation systems. A spare ratio of about 20% would be adequate.

The fleet is entirely diesel-powered, which was a major criteria in their selection by CTA. With the exception of road supervision cars, all CTA rubber-tired vehicles are diesel, thereby somewhat simplifying fueling and maintenance practices. In general, too, diesel engines have a lower maintenance cost and longer life.

Due to the high proportion of handicapped citizens using wheelchairs in the Special Services program (almost 50% of all passengers), the present fleet has a high number of wheelchair spaces in each vehicle:

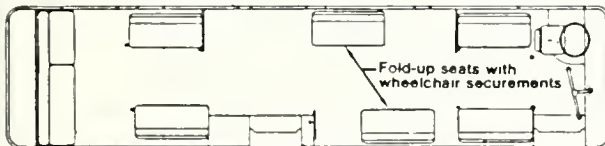
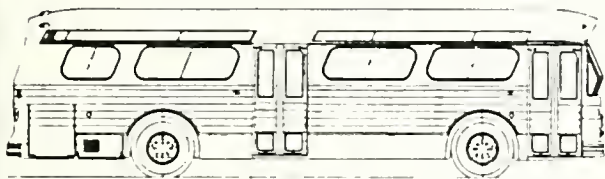
<u>Vehicle Type</u>	<u>Capacity</u>
Superior	3 wheelchairs plus 9 seated or 15 seated
Carpenter	5 wheelchairs plus 20 seated
Flxible	7 wheelchairs plus 13 seated <u>or</u> 5 wheelchairs plus 17 seated.



**Carpenter (Special Services)**

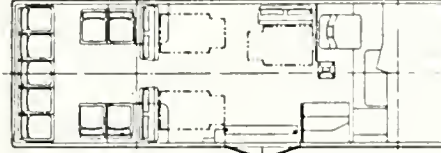
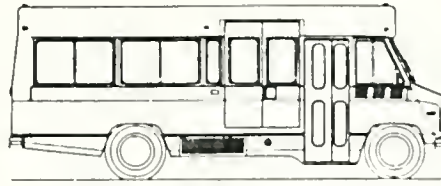
SERIES	YEAR	LENGTH	WIDTH	SEATS	WHEEL BASE	TURNING RADIUS
150-169	1982	30'-7"	8'-0"	20*	165"	30'
*with 5 wheelchairs						

Bus builder Carpenter Body Works  
 Bid price \$105,998.50/bus  
 Delivery of first bus August 1982  
 Lift Lift "U" step lift

**Flxible (Special Services)****Technical data**

Bus nos.	No. of buses 4-1-81	Series code	Mfg. & model no.	Weight (lbs.)	Fuel tank capacity (gal.)	Governor speed (mph)	Axle ratio
100-119	*20#	01	Superior 800	12,980	60	55	4.88 to 1
130-131	2	33	FLX F2D6U351-1	20,158	125	45-50	5.57 to 1
150-169	20	15	Carpenter CBW300	20,560	110	55	5.29 to 1

Engine		Data		Transmission		Alternator Output (amps)
Mfg. & Model no.	Horsepower RPM	Displacement (cu. in.)	Compression ratio	Mfg.	Model no.	
DD 4-53T	146 @ 2500	212.0	18.7 to 1	Allison	MT 643	130**
GM-6V-71N	176 @ 2100	425.6	18.7 to 1	Spicer	184	300
DD 6V53T	225 @ 2600	318	18.7 to 1			160

**Superior (Special Services)**

SERIES	YEAR	LENGTH	WIDTH	SEATS	WHEEL BASE	TURNING RADIUS
100-119	1981	23'-6 1/2"	8'-0"	9*	167"	32'-6 1/2"
*15 without wheelchairs; 9 with wheelchairs.						

Bus builder Sheller-Globe Corp.  
 Superior Lima Div.  
 Bid price \$75,336/bus  
 (\$1,506,720 for 20 buses)  
 Delivery of first bus May 1981  
 Lift Collins

SERIES	YEAR	LENGTH	WIDTH	SEATS	WHEEL BASE	TURNING RADIUS
130-131	1966	35'-1-15/16"	8'-6"	17**	225"	35'-7"
*130 was formerly bus no. 3365 and 131 was formerly bus no. 3398						
**with 5 wheelchairs; or 13 seats with 7 wheelchairs						

Bus builder Flxible Co.  
 Rebuilt CTA 1981  
 south shops  
 Lift Collins

Given the present average productivity of 1.8 passengers per vehicle service hour, the existing fleet has more than enough wheelchair capacity except for occasional group trips and "Fast-Link" services.

#### SELECTION CRITERIA

According to the knowledge of staff and our observations, CTA's current Special Services fleet was apparently selected on the basis of several criteria:

- diesel power;
- wheelchair and seated capacity;
- expected road-worthiness when operating on Chicago's street network; and
- flexibility to handle unknown demand levels and service modifications.

Although almost all specialized transportation systems in the U.S. utilize vehicles of the size of CTA's Superiors or smaller, van-type vehicles, the industry's experience with vehicle life and reliability has been poor. Under conditions of daily operation and bad roads, van-type vehicles usually experience rising maintenance costs after their 3rd year of use and are essentially worn out after 5 years. At this point, it is not normally economically practical to rehabilitate a van-type vehicle since they are usually built on a standard truck chassis, which is itself worn out after 5 years service.

CTA's preference for a diesel-powered vehicle dictated in 1980 and 1981 that a mid-size or larger vehicle be procured. Until the 1983 model year, diesel vans were not commonly available from which to build small transit vehicles.

Finally, the inherent need for a vehicle which would be flexible to accommodate relatively unknown levels of demand and peak loads as the Special Services program developed and which could be used effectively in a variety of service configurations argued for a somewhat larger vehicle than is used in most special transportation programs. The capacity to carry 5 wheelchairs in each of the Carpenter buses, for example, would



allow those vehicles to very effectively provide not only regular demand-responsive service, but also group trips and shuttle service (like the "Fast-Link").

In discussing vehicle selection, the factors of capital and operating cost are repeatedly raised in favor of small van-type vehicles as opposed to transit-type buses. From simply the standpoint of long-term capital cost, the \$106,000 Carpenter bus can be expected to serve a useful life of about 12 years; the Superior buses at a cost of \$75,000 each may operate for about 6 years; and a van-type vehicle, at about \$30,000 to \$35,000 will last an average of 4 years under Chicago conditions. If the Carpenter buses last their expected 12 years, there would have been little or no cost savings in a van purchase.

In terms of ongoing operating expense, diesel vehicles generally have a longer engine life and lower maintenance costs than gasoline-powered vehicles, all other conditions being equal. Increases in the cost of diesel fuel over the past few years have essentially equalized the price of diesel and gasoline, eliminating one major part of the operating economy of diesel vehicles.

#### FUTURE VEHICLE REQUIREMENTS

Under the present Special Services configuration, replacement vehicles will eventually be required for its fleet of 42 buses. Additionally, demand estimates made within Section 3 of this report have projected future demand for special transportation under several varied conditions which would necessitate an expanded vehicle fleet. This section projects Special Service vehicle requirements in these cases.

The projected vehicle requirements assume a spare ratio of only 20 percent and in-service use of each vehicle for 10 hours on an average weekday. In addition, the projections assume a productivity of 2.5 passengers per vehicle service hour under current eligibility policies and a higher productivity of 3.5 passengers per vehicle service hour if the service is opened for use by less severely mobility limited residents.





### Vehicle Replacement Requirements

As noted early in this section, Special Services' fleet included 20 Superior buses received in mid-1981, 20 Carpenter buses received in the Fall of 1982, and 2 Flxible buses rebuilt by CTA for Special Service use. For capital planning purposes, it is necessary to project the replacement of these vehicles on the basis of their probable useful lives.

For the Superior buses, a useful life of 6 years is expected, beginning approximately September 1981 -- on this basis, the Superior buses should be programmed for replacement in late 1987. The Carpenter buses, a larger transit type bus, are expected to have a useful life of 12 years, and began service late in 1982. Their replacement should be programmed for late 1994. The two rebuilt Flxible coaches are used by Special Services only occasionally for groups and special purposes and not for regular service. Their reliability and use should be monitored and replacement planned only if their greater capacity is needed with reasonable frequency.

It should be made clear that these estimated useful lives and projected replacement dates are only planning estimates to allow capital budgeting. Actual vehicle maintenance costs and reliability must be monitored to more closely determine when each vehicle type should be replaced.

### Future Vehicle Requirements: Status Quo Eligibility

The Special Services program currently serves only those handicapped residents of Chicago who cannot use the regular transit services due to physical handicap. Within Section 3 of this report, we have estimated the demand for service from this group in the current year, 1988, and 1992. If the Special Service program were directed to accommodate this projected level of demand, it would currently require a total fleet of 74 vehicles, as shown in Table 6-1. Because of an expected decline in Chicago population, the fleet requirements in 1988 and 1992 would be slightly less.





It should be noted that if CTA were to add these vehicles, additional demand would be generated simply by the availability of added service so that demand would not fully satisfied at any point. Demand for transportation is a "moving target" which will actually increase as efforts are made to satisfy existing perceived levels.

Future Vehicle Requirements: Expanded Eligibility

If Special Service's eligibility policy were revised to allow use of the service by those residents who today can utilize regular transit services but only with great difficulty, we have projected that the typical weekday demand for service could increase to 3,567 one-way trips per day (Section 3). To accommodate this level of demand would require about 101 vehicles in service plus 20 reserve vehicles for a total fleet of about 121 vehicles, as shown in Table 6-1.



TABLE 6-1: FUTURE VEHICLE REQUIREMENTS

<u>STATUS-QUO ELIGIBILITY</u>			<u>EXPANDED ELIGIBILITY</u>			
Year	Estimated One-Way Trips Per Weekday	Projected Fleet In Service/Spare	Total	Estimated One-Way Trips Per Weekday	Projected Fleet In Service/Spare	Total
1984	1,553	62/12	74	3,567	101/20	121
1988	1,485	59/12	71	3,412	97/20	117
1992	1,478	59/12	71	3,395	97/20	117

## B. REMOTE VEHICLE PLACEMENT

### OVERVIEW

All Special Services vehicles are currently operated out of CTA's Washington Garage, located at Washington Blvd. and Racine Avenue. All vehicle servicing and maintenance are conducted here and there is sufficient indoor storage for all Special Services vehicles. This facility also houses the program's administrative, scheduling and dispatch office, and staff. At the present time, the Washington Garage is also used for maintenance of CTA automobiles and for some midday storage of fixed-route tripper vehicles.

Although the Washington Garage is centrally located within the City of Chicago, the trips served by the Special Services program are spread throughout the city, necessitating nonproductive or "deadhead" trips from the garage to a vehicle's first pickup each day and from the last dropoff back to the garage.

One strategy to minimize this deadhead travel would be to locate some portion of the Special Services fleet in other CTA bus operating facilities in outlying areas of the city, placing them closer to their first pickup each day and last dropoff each night. This strategy of remote vehicle placement is examined within this section, particularly from the standpoint of its impact on operations and procedures.

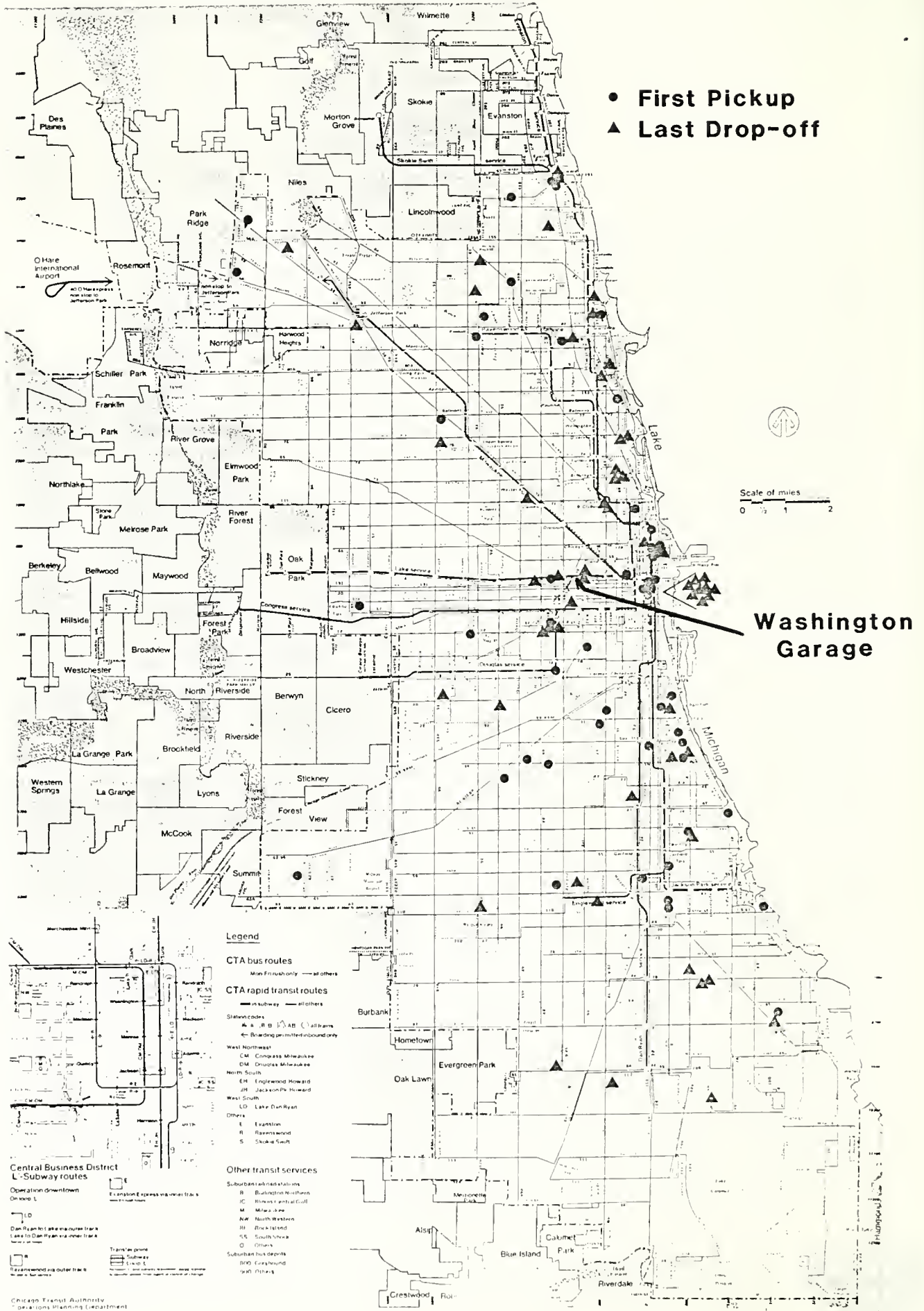
### PRESENT OPERATIONS

Beginning at Washington Garage, the Special Services vehicles disperse throughout the city to begin their daily tours. Figure 6-1 shows the locations of all first pickups and last drop-offs on a sample day (February 7, 1984). As can be seen from this display, the initial pickups and final deliveries are fairly equally distributed on a north/south basis from Washington Garage.

The need to deadhead a vehicle to and from the garage location necessitates nonproductive vehicle time as well as higher direct operating costs in terms of mileage and vehicle use. An analysis of the time



**Figure 6-1**



spent in deadheading to the first pickup on all tours on February 14, 1984, found that a total of 26.2 vehicle hours were spent between the "Start Run" time and the actual time of first pickup -- or an average deadhead of 28.6 minutes for each vehicle. Our observation of the system leads us to believe that this figure significantly overstates the actual time spent traveling from Washington Garage to that day's first pickups. Instead, this statistic includes deadhead plus an inordinant amount of time allowed for operator report time and preparation. It may also reflect an inherent absence of flexibility in operator start times to adjust to actual travel demand patterns.

The inability of Special Services management to adjust operator work hours to fit travel demand patterns was especially evident in the "dead-head" figure which could be tabulated for the return from the last delivery to the garage, which was well beyond a reasonable figure, and, consequently, has not been used for analysis.

#### ANALYSIS

On simply the basis of non-productive mileage and operator time, there would appear to be a strong case for locating a limited number of Special Services vehicles at CTA fixed-route garages in the northern and southern parts of the City of Chicago. Doing so would enable CTA to reschedule some operator shifts to eliminate early starts simply to reach the vehicle's first pickup.

On the other hand, remote placement of vehicles in other CTA garages raises other administrative and operational issues which could negatively impact service quality and management control. These issues are, briefly:

- Inability of dispatch procedures to accommodate remote placement.

Under a remote placement arrangement, a limited number of operators would work out of CTA garages in outlying areas, and come into Washington Garage possibly on a daily or occasional basis. The current dispatch system would require that hardcopy Driver Trip Sheets be transported or otherwise transmitted to each remote location each evening for the next day's service. This





would require either a new distribution service (perhaps more costly than the deadhead which was eliminated) or a change in dispatch procedures.

- Elimination or lessening of daily operator-management contact.

Daily contact between the operators and their direct management serves many purposes, among these: transmission of formal and informal communications; reinforcement of system mission and service objectives; assurance of CTA dress and appearance standards; and feedback on services, clients, and area conditions to management. The lack of daily unplanned and unstructured contact between operators and management has resulted in other systems in a deterioration of service quality and a distinctly uncoordinated and divided organization.

- Increased difficulty in upholding vehicle maintenance standards.

Washington Garage is presently the only CTA facility equipped and trained to maintain the Superior and Carpenter buses. Under a remote basing program, vehicles can be rotated into Washington Garage for regular and preventive maintenance, yet unexpected problems may have to be addressed by the remote facilities' maintenance staffs, who may not be trained or equipped for working on these vehicles. Again, the absence of informal contact between operators and the Washington Garage maintenance staff would eliminate feedback on vehicle operations and probably result in some minor problems going unnoticed.

Generally, it is our finding that the Special Services program presently incurs an excessive amount of non-productive time at the start and end of each vehicle tour. This non-productive time includes deadhead travel time to the first pickup and from the last drop-off back to Washington Garage, but also includes excess time allowed for reporting and for turn in at the end of a run as well as simply unused operator time.





Although a strategy of remote vehicle placement could potentially reduce the total non-productive miles and operator hours in the system, we believe the strategy is currently outweighed by its potential negative impacts on service quality and management control. As a further point, the present uncertainties regarding the future operator and organization of the Special Services program argue strongly for no action with regard to remote vehicle placement at this time.



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SECTION 7  
INTEGRATION WITH ACCESSIBLE RAIL TRANSIT

The development of the Special Services program and delivery of CTA's regular transit services have been predicated on the availability of a high quality, alternative accessible service to those unable to use the fixed-route and rail service. As fully accessible rail segments are constructed and completed, it becomes necessary to examine the feasibility of integrating the Special Services program with these accessible rail segments.

It should be noted at the outset that a fully-accessible rail segment is not necessarily a feasible transit alternative for all members of the severely mobility limited population (SML). Although physical and operational transit barriers may be resolved, it is possible that several significant barriers remain. Such travel barriers can exist within an individual transit mode, such as an accessible rail system, or they can exist between transit modes, such as an interface between a paratransit service and a fixed-route system.

Modal Interface

As accessible rail segments are completed in Chicago, the Special Services program has the potential of serving as an accessible feeder system. If terminals and transit stops are not easily accessible, the majority of the transportation handicapped will not utilize the system. Two such fully accessible systems, the Washington, D.C. Metro and BART in San Francisco, show very poor handicapped ridership.<sup>1</sup> This, in part, is due to the lack of an adequately accessible feeder service.

While a feeder service operated by Chicago's Special Services would remove the travel barrier of difficulty in getting to a rail station, other problems may arise which would continue to prevent the

<sup>1</sup>Crain and Associates, Transportation Problems of the Transportation Handicapped -- Vol. 2 -- The Rules of Government and the Private Sector in the Revision of Mobility Systems for the Transportation Handicapped (California: 8/76), p. 14.



handicapped from using the accessible rail system as much as they would like to.<sup>2</sup>

The barriers associated with an accessible feeder-distribution service are:

- lengthy trip time due to transfers and/or long waiting periods;
- difficulty with baggage handling;
- poor coordination of demand-responsive vehicles and fixed-route service; or
- the lack of demand-responsive service at points of origin/destination; and
- inadequate destination and route signs to direct and inform passengers.<sup>3</sup>

In addition to these problematic barriers, psychological barriers remain.

Psychological barriers are quite significant when examining the travel choice behavior of the transportation handicapped. Changes to the physical environment increasing system accessibility may not alleviate the psychological barriers which confront the handicapped and elderly. Psychological fears alone can completely deter use of a fully-accessible transportation facility by this group. The most common of these factors are:

- fear of falling
- fear of embarrassment
- fear of impatience of others
- fear of crowds/strangers
- fear of getting lost
- fear of physical assault
- fear of asking for help<sup>4</sup>

<sup>2</sup>Grey Advertising, Inc., Technical Report of the National Survey of Transportation Handicapped People, (New York: 11/78), p. 157.

<sup>3</sup>Southern California Association of Governments (SCAG), Transit Barriers California: 9/76), pp. 25-27.

<sup>4</sup>SCAG., p. 7.



Although many of these fears exist among the non-transportation handicapped, they appear to have a greater effect on the transportation handicapped.

The best non-discriminatory services to some members of the handicapped population are not necessarily those services which interface with fully-accessible mass transit. To members of the SML handicapped population, the most appealing mode is a door-to-door bus service with a lift or ramp (68.1%).<sup>5</sup>

The point of this brief discussion has been neither to argue for nor against the development of fully-accessible transit systems, but to point out that even fully-accessible systems will not meet the travel needs and capabilities of some portion of the handicapped population. This segment of the population, the SML, will not necessarily benefit from an upgraded system. Experience has shown that certain handicapped citizens cannot utilize fully-accessible public transit regardless of their convenience.

The implications of these remarks with regard to CTA's Special Services program are to highlight the importance of planning a feeder service to the accessible rail in coordination with a complete demand-responsive transit service.

#### Role of Special Services in Service Integration

As previously mentioned, Chicago Special Services is in a position to offer a coordinated and integrated fixed-rail and demand-responsive transportation package to the transportation handicapped. In order to provide the most efficient and effective service, some preliminary measures can be taken by CTA.

The first necessary step concerns proper certification of new applicants and determining the transferability of present clients. This process must identify which handicapped candidates are eligible

<sup>5</sup>Chicago Transit Authority, General Operations Division, Transition Plan to Meet Federal Section 504 Regulations (Chicago: 10/80), Section C, p. 2.



for exclusive demand-responsive transit and those who are transferable to the accessible rail system. With regard to present clients, there are three alternatives available to CTA to ensure proper service is provided to each candidate. The existing certification documents could be reviewed and transferability thus determined. Another option would require the re-certification of each client through a mailing out of the new questionnaires designed to indicate the client's transferability. The third alternative assumes all clients and new applicants are transferable unless otherwise specified by the candidate's physician. Certification forms would be available upon request of each individual. A questionnaire should be devised which not only identifies the type and the severity of the applicant's handicap, but also includes questions pertaining to the applicant's ability to transfer between and within modes (from DAR to FR and between subway stations). For new applicants, this questionnaire should be completed by a certified physician. Some members of the SML population will continue to be unable to utilize a fully accessible rail system, especially if lengthy and exhausting transfers are required. All applicants meeting Special Services criteria should be issued an identification card and number.

There will always be a segment of the handicapped population requiring a curb-to-curb service (a portion of the SML). The question becomes: Which members of the SML handicapped populations requiring transportation will be able to take advantage of the accessible rail system? When reservations are made with Special Services, it will become the responsibility of the scheduler to determine how each trip will be completed. Basically, there are three transit options available to CTA: an option based on travel time; a zoned option; and a mixed alternative, combining the most efficient aspects of the first two options.

First, the scheduler will need to determine the capabilities of each rider. By issuing identification numbers and enabling the scheduler access to corresponding computer files, client status could easily be displayed as one element of each client's identification data.





The next step in the first option available to Special Services is a quick analysis of travel time. In this analysis, it will be necessary for the scheduler to have a "rail time matrix" available for the entire system. The matrix should give the normal travel time from one accessible rail station to another, measured from the time the client debarks the Special Services vehicle at a station until they are ready for pickup at the other station. The matrix also needs to allow for the transfer time, if any, incurred by a handicapped passenger between rail lines to get from origin of trip to desired destination.

Using the rail time matrix, the scheduler will be able to estimate the client's total trip time making a transfer trip on the accessible rail system versus the entire trip on the paratransit system. If the rail trip is less than maybe 1.25 times the length of time needed for a bus-only trip, for example, the scheduler would set up the trip as a transfer to the rail system. Establishing the time differential determining a transfer versus bus-only trip is a local policy decision.

In the next option, trips are classified according to zones established by the transit authority. Short trips within one or two adjacent zones will be served exclusively by demand-responsive transportation. Trips of greater length must be completed by a transfer to accessible rail if accessible stations are available in both the origin and destination zones. If the passenger cannot transfer to the accessible system, transfers between demand-responsive vehicles are scheduled to accommodate zone changes. (This practice is currently being used in Detroit.) In addition, the fare aboard the demand-responsive vehicle will increase as zones are crossed and transfers completed. This is an added incentive for the handicapped to use the rail system for longer trips. Escorts are always free, thereby enabling those passengers who would have difficulty using the accessible rail to take advantage of it with greater ease.

The third option attempts to combine the previous two and eliminate a fare penalty for longer trips. In this option, the scheduler will have a much greater level of responsibility in the planning of each trip.



After all reservations are taken (24 hour advance) and the scheduler has determined the degree of each rider's handicap, trip planning may begin. Naturally, similar trips will be coordinated to increase productivity. In addition, trips to be scheduled for those SML passengers eligible to use accessible rail that coincide with a non-eligible SML planned trip will be scheduled together rather than institute a transfer to accessible rail. This will promote the increased efficiency and effectiveness of the Special Services operation.

Although this system is a more flexible option, it involves good judgment on the part of the scheduler to ensure timely arrivals at each client's destination. Confirmation of reservations for this option should include pick-up time and information pertaining to the mode or modes a passenger should expect to use to reach his ultimate destination.

A few additional elements should be examined at this point. The first deals with inherent limitations associated with the design of certain Chicago station platforms. Because of the platform curvature found in a few of Chicago's subway stations, accessibility for wheelchair users may be limited. This curvature helps to create a gap between the train and platform. In some cases, the gap might be overcome with the help of an escort; regardless, these stations are not truly accessible to wheelchair users. This factor should be considered by the scheduler when planning a trip for a wheelchair user until the problem is architecturally resolved.

Vehicle productivity which reflects a successfully run operation will depend heavily on the cooperation and coordination of all personnel involved in Special Services: drivers, dispatchers, schedulers, supervisors, and maintenance personnel. Service scheduling will become a very important and perhaps a more complex part of the operation. It will be important to minimize vehicle dwell time waiting for passengers as well as deliver the passengers from origin to destination in a safe and timely fashion. Good scheduling will only be effective, however, if the other members of the team respond in a speedy, efficient manner.



Good team work will become a necessary factor in a successfully run feeder/distribution service.

Eligible riders also play an integral role in vehicle productivity since they are potential users. CTA can take a very positive step here. As plans are finalized for the type of feeder service to be implemented, marketing of that new service must begin. The handicapped community must be made aware of the service offered to them. Probably the most difficult task, yet the most important, will be getting people to try the new service. Service promotions would certainly help this effort.

In addition to a visible and active service promotion, travel training may serve to increase ridership through passenger education and familiarization with the system. For the SML passengers facing a possible trip via accessible rail, travel training may help alleviate the psychological fears associated with the use of mass transit. Many handicapped persons are not familiar with public transportation. A travel training experience may serve as an educational tool as well as an instrument for building self-confidence. Travel training should include elevator use, transfer procedures, boarding and debarking trains, securing oneself on the subway, and what to do in the event something goes wrong (elevator is broken, subway is too crowded to secure oneself, etc.). In addition, the assertiveness and confidence necessary to deal with large crowds should be focused on.

As a note, it might be considered that wheelchair users having to travel on high density routes during rush hour be given special consideration. It may not be desirable to schedule transfers for wheelchair users during these periods. It will be very difficult for these passengers to enter and secure themselves properly in a subway car under such conditions. This could create a very dangerous and uncomfortable situation for such travelers.

#### Conclusion

Accessible mass transit is certainly an advancement for handicapped travelers. In addition, the provision of an accessible feeder/distri-



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butor service can be described as a progressive step toward greater mobility of handicapped persons. As more and more rail stations become accessible to the handicapped in Chicago, Special Services can increase its opportunity to become one of only a few other urban paratransit systems in America to provide a much needed coordinated transportation service. Other elements such as travel training are additional positive program enhancements.

A good marketing program aimed at informing and educating Chicago's SML population will help to make CTA's feeder service an attractive travel alternative whether the travel-time option, zoned option, or mixed alternative feeder system is implemented. In order for the program to be successful, eligible handicapped travelers must be aware of the new system and the benefits associated with its use. Additionally, it may be stressed that the service to be implemented is a response to the needs and demands of the public. In order to justify the continued provision of service to the handicapped, it must be utilized. Above all, cooperation between CTA and those passengers eligible for Special Services transportation will be the true key to a successful operation when service is first implemented.



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